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Der Effekt auditiver Stimuli auf das quantitative Elektroenzephalogramm bei Patienten mit Morbus Parkinson

The Effect of Auditory Stimuli on the Quantitative Electroencephalogram in Patients with Parkinson's Disease

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For Henning.

You have been the key.

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1.1 List of Abbreviations and Acronyms

ADASYN	Adaptive Synthetic Sample Approach
AI	Artificial Intelligence
ASI	Alpha Slow Wave Index
AU	Arbitrary Unit
BDI	Beck’s Depression Inventory
BSS	Blind Source Separation
COMT	Catechol-O-Methyltransferase
DSI	Delta Slow Wave Index
ECG	Electrocardiogram
EEG	Electroencephalography/Electroencephalogram
GPe	Globus Pallidus externus
GPi	Globus Pallidus internus
HC	Healthy Control
HOSA	Higher Order Spectral Analysis
HY	Hoehn & Yahr Scale
ICA	Independent Component Analysis
LB	Lewy Bodies
LDA	Linear Discriminant Analysis
MAO	Monoamine Oxidase
MCI	Mild Cognitive Impairment
MIQ	Mutual Information Quotient
ML	Machine Learning
MoCA	Montreal Cognitive Assessment
MRMR	Minimum Redundancy Maximum Relevance
MSC	Magnitude Squared Coherence
MT	Music Therapy
NaN	Not a Number
PD	Parkinson’s Disease
PLI	Phase Lag Index
PSP	Post-Synaptic Potential
PSD	Power Spectral Density
qEEG	quantitative Electroencephalogram
SNr	Substantia Nigra Pars reticulata
STN	Subthalamic Nucleus
SVM	Support Vector Machine
UBC	University of British Columbia
UPDRS	Unified Parkinson’s Disease Rating Scale

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2 Introduction

2.1 Epidemiology, Diagnosis and Pathophysiology of Parkinson's Disease

The idiopathic Parkinson's Syndrome (Parkinson's Disease, PD) as first described by James Parkinson in 1817 (Parkinson, 2002) is the second most common neurodegenerative disorder with rising incidence and prevalence worldwide (Muangpaisan *et al.*, 2011). Its cardinal symptoms affect the motor system and typically include akinesia, rigidity, tremor and postural instability while cognitive and behavioral problems such as depression and anxiety commonly appear as well (Yao, Brown and Shoaran, 2018). The variety and severity of the symptoms usually have a significant negative impact on the patients' quality of life and can lead to significant stress and financial burden on caregivers (Chen, 2010). PD is diagnosed clinically based on bradykinesia or akinesia and at least one of the symptoms resting tremor, rigidity and postural instability. A definitive diagnosis of PD still requires the postmortem identification of Lewy neurites or Lewy bodies (LB) in a histopathological assessment. Lewy bodies are tissue deposits typically composed of the protein alpha-synuclein (Kouli, Torsney and Kuan, 2018). The exact etiology of PD remains vague and is most likely multi-factorial: genetic risk factors have been identified (for example in the alpha-synuclein SNCA-gene) (Billingsley *et al.*, 2018) while environmental risk factors have been discussed as well (Herbicides/Pesticides) (Liou *et al.*, 1997).

The pathophysiology of PD is characterized by the loss of dopaminergic neurons mainly in but not limited to the substantia nigra, a part of the extrapyramidal motor system. The neurotransmitter dopamine plays a central role in motor activity and makes up 80 % of the catecholamines in the human brain. It is synthesized from the amino acid tyrosine and released into the intersynaptic space by monoaminergic vesicles before being degraded by the enzyme monoamine oxidase (MAO) (Segura-Aguilar *et al.*, 2014). The loss of dopaminergic neurons leads to a diminished level of dopamine in the basal ganglia, especially the striatum. The basal ganglia in turn are central in the control of movements via feedback mechanisms and their connection to the cerebral/motor cortex. The consequent impairment of dopaminergic signaling is considered the main cause for the development of motor symptoms (Kouli, Torsney and Kuan, 2018). The basal ganglia circuit is shown in more detail in figure 1 below.

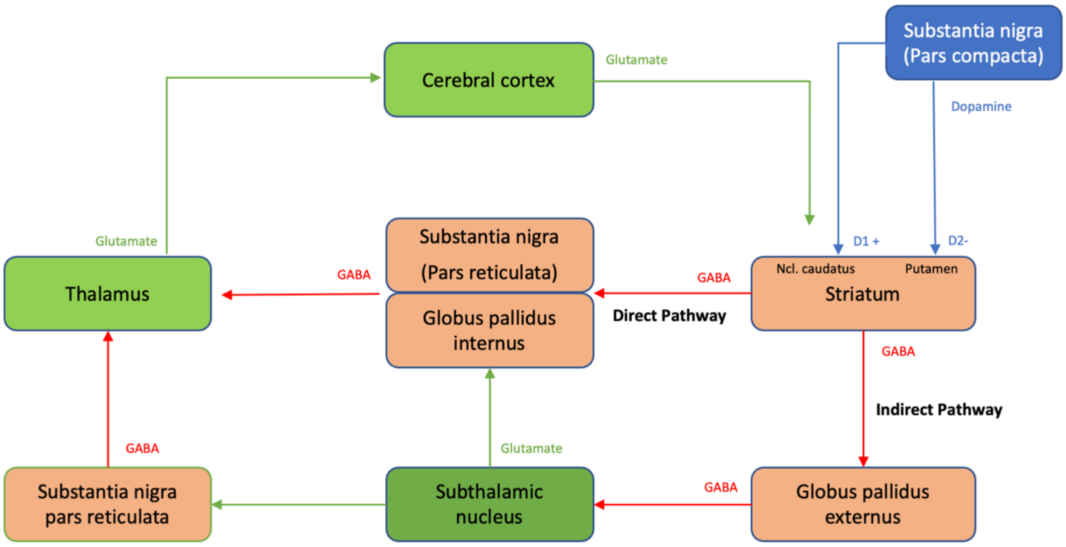

Figure 1: **The Basal Ganglia Circuit**

Green: excitatory, Red: inhibitory
The indirect pathway is mainly based on dopamine's inhibitory influence on D2 dopamine receptors in the striatum (putamen). The striatum projects to neurons in the globus pallidus externus (GPe). The GPe projects to the Subthalamic nucleus (STN). The STN projects excitatory input to the globus pallidus internus (GPi) and the substantia nigra pars reticulata (SNr). GPi neurons synapse in the thalamus. The thalamus, in turn, provides excitatory input to the cortex.
The direct pathway is based on dopamine's excitatory influence on D1 dopamine receptors in the striatum (Ncl. caudatus). The striatum projects directly to the GPi and SNr.
In PD, the loss of dopaminergic neurons in the substantia nigra causes dopamine depletion in the nigrostriatal pathway. This leads (1) to an overactivity of the indirect pathway and thus disinhibition of the STN and consequently overactivity of the output nuclei GPi and SNr. The dopamine depletion leads (2) also to decreased inhibition of the direct pathway. This causes additional disinhibition of the output nuclei. The increased output causes increased inhibition of the thalamus and thus reduced excitatory input to the motor cortex (Obeso *et al.*, 2000).

Within the complex balance of signal pathways in the basal ganglia, the direct and the indirect pathway between the striatum and the internal division of the globus pallidus can be emphasized as central. The decreased levels of dopamine lead to a relative overactivity of the indirect pathway and relative underactivity of the direct pathway and can thereby cause the motor symptoms bradykinesia, akinesia and rigidity (Hallett, 2020). However, the actual pathophysiology of the basal ganglia circuit in PD is more complex than indicated in the figure above. It is subject to constant reevaluation (Obeso *et al.*, 2000).

PD is generally seen as a progressive disease. The progress is usually described with help of the Hoehn and Yahr Scale as first published in 1967 (Hoehn and Yahr, 1967):

HY Stage 1: Unilateral involvement with minimal or no functional impairment
HY Stage 2: Bilateral involvement without impairment of balance
HY Stage 3: Bilateral involvement with impaired postural reflexes
HY Stage 4: Severely disabling disease, but still able to walk and stand unassisted
HY Stage 5: Confinement to bed or wheelchair unless aided.

2.2 Therapeutic Approaches in Parkinson's Disease

Given the pathogenetic loss of dopaminergic neurons, the therapy of PD is essentially pharmacological and mainly focusses on dopaminergic replacement via either levodopa or dopamine agonists (Magrinelli *et al.*, 2016). Levodopa, the precursor to dopamine, is the most potent drug for the treatment of PD symptoms and used in combination with peripheral dopa decarboxylase inhibitors such as carbidopa or benserazide to inhibit its peripheral metabolism before reaching the blood-brain barrier. However, patients frequently suffer from side effects of levodopa including motor fluctuations, dyskinesias, nausea and vomiting after approximately five years of treatment (Katzenschlager and Lees, 2002). As such, the side effects and benefits of levodopa therapy both need to be carefully taken into account. For some patients it might even be recommendable to delay the onset of levodopa therapy to postpone the onset of side effects as long as possible. An alternative to levodopa therapy is the use of dopamine agonists. Dopamine agonists such as pramipexole and ropinirole are often used as an alternative to levodopa in the early stages of PD with only mild symptoms. Dopamine agonists have the advantage to only show limited side effects but are also less potent as levodopa on parkinsonian symptoms. They may be efficiently used to postpone the onset of levodopa therapy up to several years (Jankovic and Aguilar, 2008). In the event of levodopa-induced side effects several drugs can be used to improve dyskinesias in addition to the reduction of the drug dose. These drugs include COMT (Catechol-O-methyltransferase) inhibitors and MAO (Monoamine oxidase) inhibitors. Eventually, the decision for the suitable therapy needs to take all the above mentioned and comorbidities into account to make an individual treatment decision for every patient.

Due to the difficulty to control progressing symptoms by conventional therapy and its associated side effects, complementary non-pharmacological approaches have been increasingly developed including deep brain stimulation, ergotherapy, physiotherapy and art therapy (Rabin *et al.*, 2015). One of the most prominent complementary approaches is music therapy (MT) (García-Casares, Martín-Colom and García-Arnés, 2018). Music therapy is applied in various contexts including singing, song learning and dancing. These approaches have been shown to be beneficial in various aspects such as better motor control, swallowing, breathing and emotional and psychological well-being (Machado Sotomayor *et al.*, 2021). In detail, auditory stimuli like music and natural sounds can alleviate motor complications such as the freezing of gait (DeMaagd and Philip, 2015) and the reduced stride length (Nombela *et al.*, 2013) as well as improve the precision of arm and finger movements (Bernatzky *et al.*, 2004). Furthermore, it has been observed that the effects of music can improve the perceptual as well as the motor timing (Benoit *et al.*, 2014).

However, it has not yet been sufficiently resolved why exactly auditory stimuli can potentially be so effective. In other words: potential reasons for the beneficial effect remain unclear. On the one hand, it is not yet completely clear which characteristics of an auditory stimulus are crucial. It has often been convincingly shown that rhythm seems to be relevant (Nombela *et al.*, 2013). Further research has revealed, however, that music not based on rhythm like classical Chinese music (Wu *et al.*, 2012) or classical Hindustani music (Banerjee *et al.*, 2016) can have beneficial effects as well. On the other hand, it has not yet been sufficiently explained which physiological mechanisms of the neuronal response may primarily explain these positive effects. Possible explanations include the release of dopamine (Salimpoor *et al.*, 2015) as well as increased functional brain connectivity (Blum *et al.*, 2017).

2.3 Quantitative Electroencephalography as the Appropriate Analytical Tool

A promising way to look at these questions is provided by measuring cortical activity with help of Electroencephalography (EEG). This is due to several reasons. First, the EEG offers a high temporal resolution. This makes it suitable for capturing the dynamics of sound as well as cognitive processes which can vary considerably in length. Second, the EEG measures neural activity directly which makes findings among different international studies more consistent and reproducible. Consequently, the increased reliability makes it easier to link findings to already established research and to further build on from there. Finally, EEG devices are lightweight, portable and comparably inexpensive. This can make data collection more flexible and thus make a possible use for treatment easier (Cohen, 2011).
Electroencephalography is based on voltage fluctuations of cortical pyramid cells which are mainly measured on the scalp with a set of electrodes. The measured voltage fluctuations occur due to changes of the membrane potentials and thus ionic currents generated at the synapses as post synaptic potentials (PSPs) (Schomer and Lopes da Silva, 2017). As it is not possible to detect single PSPs, the activities detected by the EEG show sum potentials of a number of cortical synapses.

After measuring, the analogue signal is being amplified and digitalized for further analysis. Digitalization works by recreating the analogue signal digitally as a combination of amplitude resolution and sampling frequency. The amplitude resolution divides the amplitude of a measured voltage into digital bits for representation. The sampling rate indicates how many digital data points characterize a measured analogue signal per second, thus in the time domain. Intuitively, a higher sampling rate recreates a more accurate signal but at the same time causes higher computational costs. According to the Nyquist theorem, to recreate an accurate digital signal the sampling rate should be at least twice of the highest measured frequency (Ocak, 2009).

A periodic sequence of sum potentials can be seen as sinusoidal waves within the EEG (Speckmann, Hescheler and Köhling, 2019). These sinusoidal waves can be categorized according to their frequency into frequency bands. The boundaries of these frequency bands differ in literature to some degree but center around similar values. For this study, the following frequency bands have been used (table 1).

Table 1: **EEG Frequency Bands used in this Study**

Frequency (Hz)	Band	Subband
0.5 – 2	Delta	Delta 1
2 – 4	Delta	Delta 2
4 – 6	Theta	Theta 1
6 – 8	Theta	Theta 2
8 – 10	Alpha	Alpha 1
10 – 12	Alpha	Alpha 2
12 – 29	Beta	Beta
30 – 60	Gamma	Low Gamma
61 – 90	Gamma	High Gamma
91 – 120	Epsilon	Low Epsilon
121 – 150	Epsilon	High Epsilon
151 - 249	Broadband Act	Broadband Act

In addition to frequency-based analysis and the analysis by eye, the analysis of the EEG can be extended to computational processing of the signal. This approach is called quantitative EEG (qEEG). The qEEG is based on spectral analysis via Fourier transformation. Fourier transformation in turn works by recovering the single frequencies which make up the composite EEG signal (Başar, 1980). The analysis might then include more complex EEG characteristics and thereby provide an even deeper insight for analysis. These characteristics can relate to the time and frequency domain, power spectra, shared activity and wave indices (Nuwer, 1997).

When analyzing a qEEG it is important to decide which measurable characteristic of the EEG the analysis should be based on. A measurable characteristic is also called feature. Every feature of the EEG adds to the complexity of the analysis. This increases the computational cost and can render the analysis more time intensive and less precise. For this reason, many similar studies focus on just a few features such as frequency bands, dominant peaks or global spectral power. These studies, however, concentrate on different features and their findings are not always consistent.

The present study takes a rather wide range of features into account as it was carried out in the context of a large-scale biofeedback project at the University of British Columbia (UBC) in Vancouver, Canada. Neurofeedback has been shown to be potentially efficient in the treatment of PD and seeks to enable patients to train specifically those brain areas that are involved in the control of body movements (Linden, 2016). For an effective neurofeedback mechanism, it is important to be able to detect parkinsonian patterns of different types and to be as comprehensive as possible in its analysis of the

EEG because relevant features might differ among patients. Features that are found to be relevant in the present study on auditory stimuli might then also be used in neurofeedback therapy. Consequently, instead of single features, it is desirable in this case to find a set of features that might characterize PD in the EEG although this might be computationally expensive at first. In total, this study uses 72 potential features ranging from basic frequency band features to higher order spectral analysis (HOSA). The feature types used in this study will be explained in the following section, a comprehensive table listing all features extracted from the EEG can be found in the appendix.

1) The average relative band power of the frequency bands as introduced in table 1. The average relative band power can be seen as the spectral power of a given frequency band in relation to the total spectral power of a signal and indicates how much power each frequency band contributes to the overall power of the signal. The power is calculated by squaring the amplitude as a function of the frequency (Vallat, 2018).
2) The harmonic parameters allow for a more detailed spectral analysis of the single frequency bands as seen in point 1. The three harmonic parameters are the center frequency, the bandwidth, and the spectral value at the central frequency. They are defined as

$$\text{center frequency } f_c = \frac{\sum_{f_l}^{f_h} f P_{xx}(f)}{\sum_{f_l}^{f_h} P_{xx}(f)},$$

$$\text{bandwidth } f_\sigma = \frac{\sum_{f_l}^{f_h} (f-f_c)^2 P_{xx}(f)}{\sum_{f_l}^{f_h} P_{xx}(f)} \text{ and}$$

$$\text{the spectral value at the center frequency } S_{f_c} = P_{xx}(f_c),$$

where f_l and f_h are set in accordance to the frequency bands as seen in table 1 and P_{xx} is the power spectral density estimate (PSD) according to Welch's method (Simões *et al.*, 2010). The harmonic parameters are calculated for each band in the EEG spectrum.

The Welch's PSD is also a spectral density estimator and estimates the signal power at different frequencies, similarly to point 1. The data is, however, split into overlapping time-domain segments and windowed. The spectral power of each of the overlapping segments is averaged (Smith, 2020). Welch's method thereby reduces noise in the power domain at the expense of the frequency resolution (Welch, 1975). In this study the overlap has been chosen as 50 % of the window length being the default setting for the 'pwelch' function in Matlab.

3) The slow wave indices describe the ratio of each of the slow frequency bands (Delta, Theta, Alpha) to the other two slow frequency bands. To give an example, the Alpha Slow wave index (ASI) is defined as the band power of the Alpha frequency band divided by the band powers of the Delta and the Theta frequency bands (Jobert *et al.*, 1994):

$$ASI = \frac{BSP_{Alpha}}{BSP_{Delta} + BSP_{Theta}} \, .$$

4) The Hjorth parameters focus on the variance to describe dynamic temporal information of the EEG signals. They thus focus on the time domain in contrast to the first three feature groups which focus on the frequency domain. The Hjorth parameters characterize the signal in its activity (variance), its mobility (representing the mean frequency) and, by comparing it to a pure sine wave, its complexity (representing the change in frequency) (Boostani and Moradi, 2004). The three Hjorth parameters can be described as

$$Activity = var(x) \, ,$$

$$Mobility = \sqrt{\frac{var(x')}{var(x)}} \text{ and}$$

$$Complexity = \sqrt{\frac{var(x'').var(x)}{var(x')^2}} \, ,$$

where x is the signal and x' is the signals derivative.

5) Skewness measures the asymmetry of a signal in the time domain or, put differently, the "non-equivalence of EEG waves around the horizontal (…) axis" (Bullock *et al.*, 1997). When imagining a signal or a distribution, a positive skewness would mean a tail on the right side whereas a negative skewness would mean a tail on the left side.

Kurtosis is sometimes being referred to as the 'spikiness' of a signal. It refers to non-Gaussianity of a signal. Consequently, the lower the value of kurtosis the greater the similarity of the signal to a Gaussian distribution (Wang *et al.*, 2015). The Kurtosis feature is thus able to detect unusually peaked signals or distributions (Delorme, Sejnowski and Makeig, 2007).

6) The bispectrum is a feature of Higher Order Statistical Analysis (HOSA). Higher Order Statistics make use of the third or higher order in the analysis of a mathematical term. As such, the bispectrum is an example for the transformation of cumulants to a spectrum of higher order. The second order cumulant can be seen as the covariance and thus as a measure of dependence of two variables from each other. The third order cumulant is a measure to examine the dependence of three variables from each other where the dependence between just two of the three variables is left aside. In the bispectrum, the three variables are the signal and the same signal at two further points in time. Assuming that the Fourier transform of the *second-order* cumulant-generating function is the power spectrum, the bispectrum can also

be described as the Fourier transform of the *third-order* cumulant-generating function (Schwilden, 2006). The extension to higher order spectra allows for the analysis of non-linear interactions and checks for components of a time series deviating from a Gaussian distribution and thus additional information to the power spectrum (Bullock *et al.*, 1997). In addition to the absolute value of the bispectrum, the phase angle within the bispectrum is calculated as a separate feature.

In this paper, the bispectrum is calculated for a total of 8 frequencies, representing frequencies from the frequency bands as introduced in table 1.

7) Wavelet Coefficients and wavelet transform describe an adaptive time-frequency analysis method. As such, it is generally intended to analyze the time-domain and the frequency-domain (spectral analysis) in a combined way. This is interesting as pure time domain analysis does not provide frequency information whereas spectral analysis does not reveal at which time frequency-related events occur. This is especially convenient in EEG analysis as EEG signals tend to be nonstationary (i.e. statistical properties may vary over time) making it very interesting to see *when* precisely changes in frequency occur. To give an example from signal processing, a higher time accuracy may be needed to locate high frequency waves while for slow waves it might be more interesting to look at the spectral resolution. Wavelet transform can look at both aspects in an adaptive way (Ebrahimi *et al.*, 2008). This is possible as wavelets are artificial brief oscillations (i.e. functions) that can be designed as needed to be compared to a signal. They can be enlarged or compressed to capture low as well as high frequency components (Radhakrishnan, 2018). The performance of the wavelet-based modeling is sensitive to the choice of decomposition level. Therein, each decomposition level corresponds to a frequency band. Accordingly, with each level of decomposition, the frequency bands will be narrower, accounting for a better frequency resolution. In this paper, given the sample frequency of 500 Hz, 8 levels of decomposition have been used to capture all frequency bands including delta (The MathWorks, Inc., 2022).
8) Coherence is a feature to determine whether different electrodes at different locations record similar neuronal oscillatory activity. If detected, coherence might indicate functional and/or anatomical connections across the brain (Bowyer, 2016). The coherence can be calculated as the magnitude squared coherence (MSC) of two input signals, in this case signals recorded by two electrodes. In case of perfect coherence, the value of MSC is 1, in case of no coherence the MSC is 0 (Cui *et al.*, 2017).

   In this study, coherence of three electrode pairs have been tested: Both electrodes of the tested electrode pairs were in the same region of the scalp, frontal, central and parietal.

Within each electrode pair, one electrode was on the left, the other on the right side of the scalp to analyze for interhemispheric coherence (figure 2, b).

9) The phase lag index (PLI) is another feature to measure synchronized interactions between neural signals by focusing on phase synchronization. It analyzes how phase differences are distributed across of two or more EEG signals (Bastos and Schoffelen, 2016). The PLI value can range between 0 for no coupling to 1 for perfect phase locking (Chaturvedi *et al.*, 2019). In this study, the frontoparietal PLI has been calculated for a pair of central electrodes and a pair of each the left and the right side of the scalp. As such, in contrast to the coherence feature, the PLI was used to analyze for synchronization between different regions of the brain in the same hemisphere (figure 2, a).

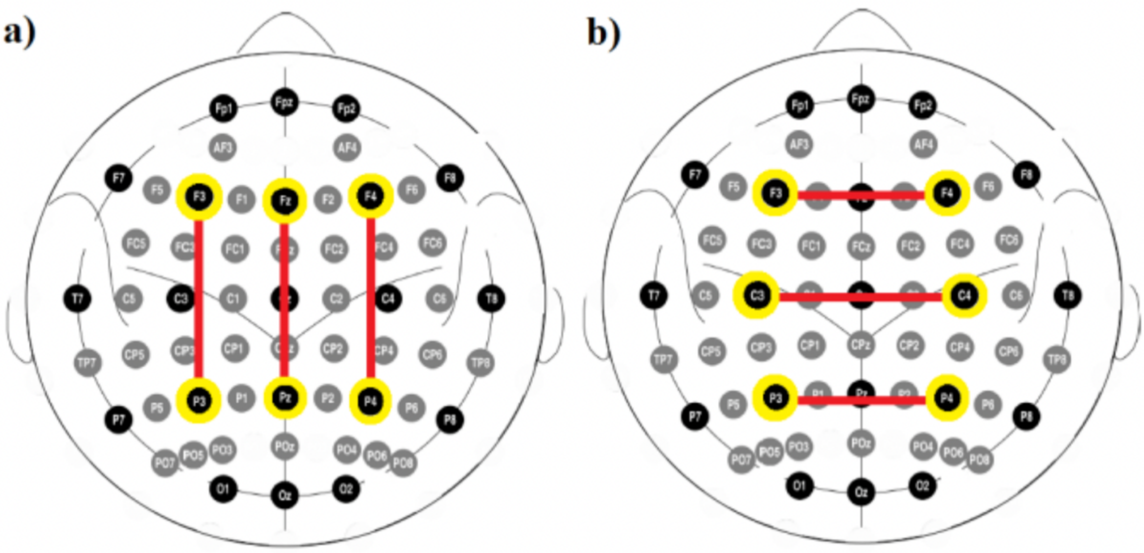

Figure 2: **Schematic Overview of Analyzed Electrode Pairs**

a) Fronto-parietal Electrodes (F3-P3, FZ-PZ, F4-P4) for the Phase Lag Index and b) Inter-hemispheric Electrodes (F3-F4, C3-C4, P3-P4) for Coherence. Electrodes positioned according to the International 10-10 System (Carmona, Suarez and Ochoa Gomez, 2017)

2.4 Pattern Recognition as the Appropriate Interpretation Tool

The objective behind the large number of features has been described above. The simultaneous analysis of a number of features, however, is complex. A possible way to visualize such an analysis is to depict each feature as an axis in a coordinate system and to plot each EEG measurement along this axis. With each feature adding a dimension to the coordinate system the analysis of n features can be imagined as an n-dimensional coordinate system. A high dimensional coordinate system is called a feature space.

The recording of multiple features with multiple different electrodes thus results in a high dimensional and thus a computationally intensive feature space. This in turn necessitates a computer-based analysis. As mentioned earlier, this study aims to find specific parkinsonian patterns (i.e. combinations of features) in the EEG. Therefore, a so-called Pattern Recognition algorithm has been used in this study to distinguish subjects with PD from Healthy Controls (HC). Pattern Recognition works by analyzing recurring PD- or HC-specific patterns in the high-dimensional features space of the EEG recordings. Pattern recognition is an application of Machine Learning (ML) which is in turn seen as a subset of Artificial Intelligence (AI) (Bishop, 2006).

2.5 Potential Markers of Parkinson's Disease in the Electroencephalogram

So far, several approaches have been made to differentiate patients with PD from HC by analysis of the qEEG. Among the first to study the differences in the EEG of PD and HC was Neufeld et al. 1988 who visually evaluated the EEG before computer-based tools for spectral analysis were available. By analyzing demented and non-demented parkinsonian patients they observed a generalized mild slowing of activity especially in demented but also in mentally intact patients (Neufeld, Inzelberg and Korczyn, 1988).

Since the introduction of spectral analysis, it is possible to take a closer look and analyze the qEEG to discover possible features for differentiation. Pezard et al. compared 9 patients in the early stage of PD (Hoehn and Yahr Stages 1-2) with 9 age-matched HC and found a decrease in relative beta-power as an early sign of PD (Pezard, Jech and Ruzicka, 2001). Han et al. also tested 15 early-stage PD patients with an equal number of HC and observed a decrease in the relative power of alpha and beta as well as an increase in the relative power of delta at all 20 electrodes used. The relative power of theta was seen to have increased in all channels except the frontal ones which resembles a slowering of brain activity (Han *et al.*, 2013). Chaturvedi et al. compared 50 PD patients to 41 HC and were able to develop a small subset of features to distinguish between PD and HC, especially the theta-power in the temporal left region and the alpha1/theta ratio in central regions. The feature set also includes the relative powers of alpha2 and beta (Chaturvedi *et al.*, 2017). Soikkeli et al. also found a significant decrease of relative alpha and beta power together with a significant increase of relative delta and theta power in demented PD patients. For non-demented PD patients these findings still applied to the theta and beta activity (Soikkeli et al., 1991).

In line with these findings, Kamei et al. calculated the spectral ratio as the sum of power values of the faster waves (alpha and beta) divided by the sum of power values of the slower waves (delta and theta). They found a significant decrease of the spectral ratio at the frontal pole and frontal locations in PD patients (Kamei *et al.*, 2010). Additionally, they showed in a second study that the slowing correlated significantly with the progress of the disease (Kamei and Morita, 2013). In a study with a smaller sample size Serizawa et al. found a decrease of the spectral ratio at other locations than frontal as well (Serizawa *et al.*, 2008). In addition to the analysis of subbands, Moazami-Goudarzi et. al found that the dominant peak was shifted towards lower frequencies. Despite this shift the global spectral power had increased over the frequency range from 2-100 Hz (Moazami-Goudarzi *et al.*, 2008).

Silberstein et al. concentrated on the role of changes in inter-regional cortical synchronization in parkinsonian patients off treatment, during high-frequency stimulation and following drug treatment compared to HC. They follow that a coherence over 10-35 Hz correlated with the severity of parkinsonism. Furthermore, reductions in the cortical coupling over this frequency range following treatment showed a correlation with clinical improvement (Silberstein *et al.*, 2005).

2.6 Research Questions

As indicated before, the exact underlying mechanism of the beneficial effect of auditory stimuli remains unclear. The knowledge of PD-specific qEEG features might therefore help to better understand the parkinsonian brain and the underlying neuronal processing of music therapy. It might render therapeutic approaches based on music and sound more effective and better adjusted to the needs of PD patients. In line with this, the present study aims to answer the questions listed below:

1) Is it possible to distinguish the EEG-data of PD patients from the EEG-data of HC with a pattern recognition algorithm?
2) Do auditory stimuli show an effect on the qEEG of PD patients or HC and thus on classification?
3) Which are the most relevant features for classification?
4) Which characteristics make an auditory stimulus effective to change the EEG?

3 Methods

3.1 Recruiting and Assessment of Patients with Parkinson's Disease and Healthy Controls

EEG data-sets of 12 patients with PD and four age-matched HC were recorded between May 2017 and September 2018. The patients were recruited from the Movements Disorders Clinic at the UBC whereas the HC were either spouses of the patients or recruited from the community. Following the principal of voluntary participation, informed written consent was obtained from all patients and controls. This was according to the protocol approved by the Board of Research Ethics at the UBC for the main study called "EEG-based neurofeedback to alleviate the Parkinsonian state and improve motor function" (Study-No: H14-01772), the present study being a subpart of the former one. The ethics protocol can be found in the appendix.

Inclusion criteria were mild to moderate idiopathic PD (Hoehn and Yahr-Scale ≤ 3) for the patients and age 40-85 as well as a normal or corrected-to-normal hearing for both groups. The exclusion criteria were a hearing impairment that could not be corrected by a hearing instrument, medically induced or atypical Parkinsonism, significant cognitive impairment including severe dementia as assessed by a specialist, epilepsy and any intake of sedating or other EEG changing medication. The cognitive impairment was assessed by the Montreal Cognitive Assessment (MoCA) where a score of at least 18 out of 30 was required to participate in the study. In addition, Beck's Depression Inventory (BDI) and the Unified Parkinson's Disease Rating Scale Part III (UPDRS-III) were used to ensure a preferably homogenous subject population. For the correct implementation of the UPDRS, training and a respective certificate by the International Parkinson and Movement Disorder Society was obtained by the examiner. The BDI was obtained to make sure the subjects were at most having a borderline clinical depression. The UPDRS-III was used to assess the severity of motor symptoms related to PD. During testing the patients were on their usual dopaminergic medication. The UPDRS certificate can be found in the Appendix.

3.2 Experimental Set-Up and Recording of the Electroencephalogram

All subjects were placed comfortably in a chair in a sound-insulated room. A 64-channel EEG cap (Neuroscan Ltd) was fitted to their head and connected to the high impedance amplifier Neuroscan SynAmps (Compumedics Neuroscan Ltd., VA, USA). For recording, 34 of the 64 electrodes were used in accordance to the international 10-20 EEG system as seen in figure 3 (Milnik, 2009):

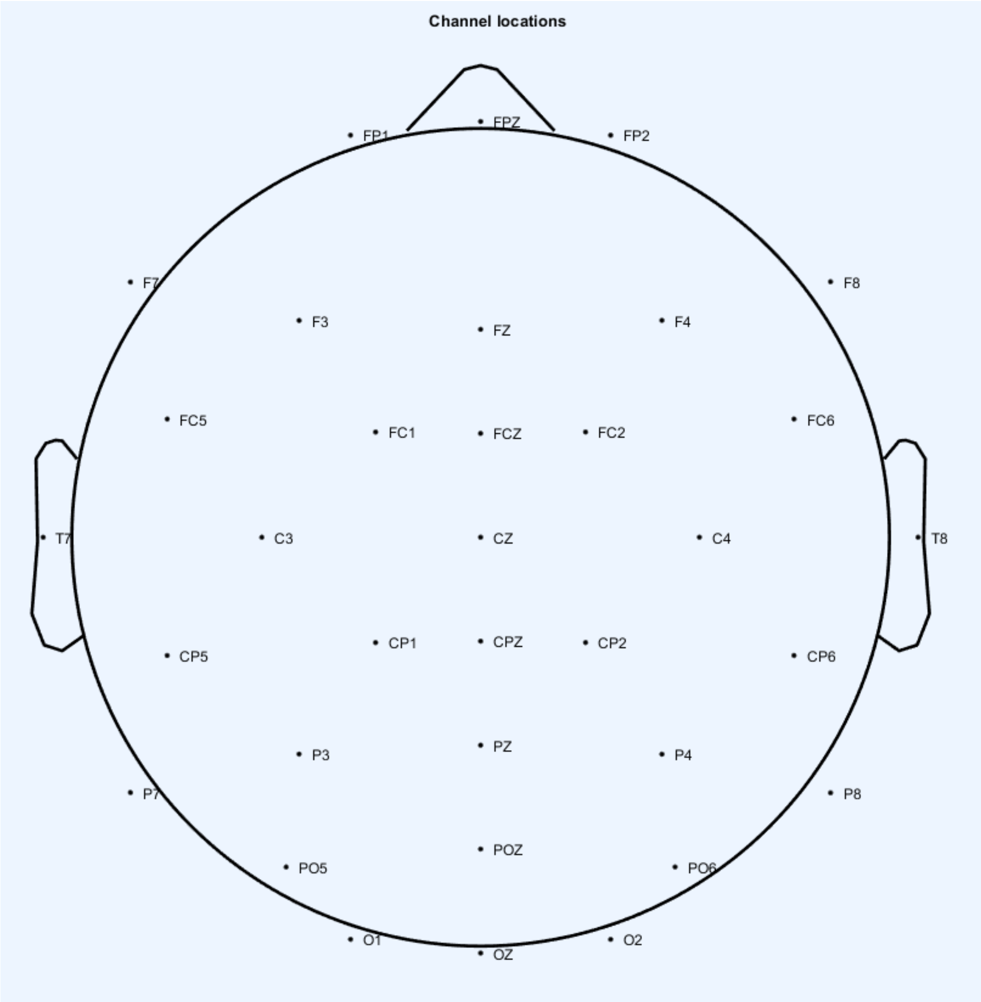

Figure 3: **Locations of the 34 Electrodes on the Scalp**

Electrodes placed in accordance to the international 10-20 EEG system (Milnik, 2009)
F = Frontal, C = Central, P = Parietal, T = Temporal, O = Occipital, Z = Midline

Within the matrix representing the digitalized signal, the channels have been ordered from left to right and from frontal to occipital, starting with FP1 and ending with O2. A complete table of the channels in order of digitalization can be found in the appendix.

Further, two reference electrodes were placed at the earlobes of the subject. The impedance was lowered to less than 20 kΩ using Electro-Gel (Electrode-Cap International, OH, USA). For the detection of artifacts following vertical and horizontal eye movements, two extra pairs of surface electromyographic electrodes were added. The stimulating sounds were played using wireless Bluetooth in-ear headphones (JVC HA-F250BT) which patients were asked to adjust to a convenient maximum volume. The sounds were modulated via a Graphical User Interface (GUI), custom-written for this study in MATLAB (MathWorks, Natick, USA), an exemplary picture can be seen in figure 4 below. During testing the subjects were awake and had their eyes closed. Recording was done at a sampling rate of 500 Hz to be able to correctly digitalize frequencies up to 250 Hz (Broadband Act) in accordance with the Nyquist theorem as explained in 2.3.

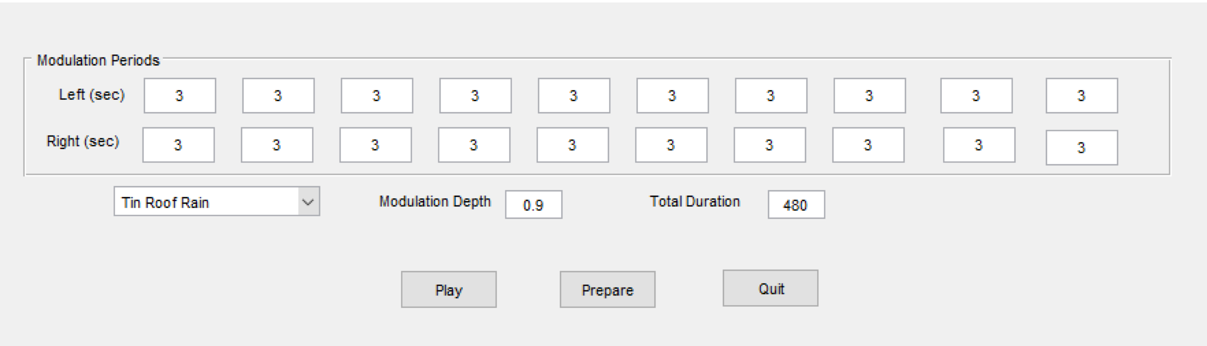

Figure 4: **Custom-made Guided User Interface (GUI) for Modulation of Sounds**

The sounds being modulated in volume with different durations (3 seconds in this example) after which volume peaked. Volume was modulated in a sinusoidal way between a maximum defined as convenient by the patient and a minimum of 10 % thereof. The short cycle duration of 3 seconds was intended to give a rhythmic feel and at the same time matched the epoch length. For a complete overview of the modulation characteristics for each recording view table 2.

3.3 Design of the Auditory Stimuli

Due to the complexity of music as a stimulus and the mere number of features that might cause effects (e.g. rhythm, pitch, timbre etc.), modulations of simple naturalistic sounds have been used to simplify the input. This provided for a less complicated stimulus while at the same time reducing the impact of subjective factors on the data such as personal preferences and musical knowledge of the subjects. The sounds used in this study can be found at the webpage mySound.net, the permission to use these sounds for the present study was kindly granted by the lead sound engineer of the Webpage, Dr. Stéphane Pigeon (Pigeon, 2013).

For every subject, five sets were recorded on different stimulating conditions as shown in table 2.

Table 2: **Modulation Characteristics of the Sounds for Recordings**

Recording	Total Duration (Seconds)	Sound	Cycle Duration (Seconds)	Modulation Depth (Artificial Units)
1	300	n/a	n/a	n/a
2	480	Rain	3	0.9
3	480	Spring Walk	3	0.9
4	480	Rain	9	0.9
5	300	n/a	n/a	n/a

Two different kinds of naturalistic sounds were used in this study. The first one was solely the sound of rain falling on a tin roof ('Rain'). The second one was a mix of different sub-sounds typical for a walk during springtime, such as birds, bees, gentle footsteps on forest floor and the gurgling of a little creek ('Spring Walk'). As such, the two sounds differed in composition and complexity. The sounds were continuously modulated in volume and in two different versions of cycle duration after which volume peaked. The volume varied in a sinusoidal way between a maximum defined as convenient by the patient and a minimum of 10 % thereof. The first and shorter cycle duration of three seconds was intended to give a sense of rhythm; the longer second version of nine seconds cycle duration lacked that rhythmic character and was rather non-metrical.

The recording sequence for each subject was as follows: five minutes of resting state data without auditory stimulus were recorded first as a reference data set. Second, a data set of eight minutes was recorded during which the first modulation of the Rain sound was played with cycle duration of three seconds and a modulation depth of 0.9. Third, a data set with the same length and modulation parameters was recorded of the Spring Walk sound. The maintaining of parameters was intended to facilitate the comparison of different sounds for the same modulation. Fourth, a set of eight minutes was recorded with a different modulation of the Rain sound. The cycle duration was nine seconds and thus not rhythmical anymore. The maintaining of the sound between the second and the fourth condition was in turn intended to facilitate the comparison of different modulations (e.g. tempo and rhythm) for the same sound. As a last set, another five minutes of resting state data were recorded in order to see whether the stimulation might have an ongoing effect even after it had stopped.

3.4 Analysis

3.4.1 Overview

Recording the EEG of 16 subjects at a sampling rate of 500 Hz for more than 30 minutes per subject results in a substantial amount of collected data. The amount of data in combination with the high dimensionality of analysis requires a computer-based approach. In this case, a pattern recognition approach has been chosen to discriminate the data of PD patients and HC with help of a Support Vector Machine (SVM).

Pattern recognition is a common application of ML and is typically carried out as an algorithm. As such, it is a sequence of analytical steps. First, the digitalized EEG-data is preprocessed and segmented into parts, so-called epochs, in order to prepare the data for analysis. Then, respective values of the 72 features are measured from each of the 34 EEG electrodes. This is called feature extraction. Each electrode is considered to be one channel. The measured values of each feature might differ depending on their location and thus in every channel. Consequently, measurements of the same feature in different channels are mathematically treated as separate features.

As such, the measurement of 72 features in 34 channels results in 2448 features and thus 2448 dimensions for analysis. To avoid high dimensionality and to thereby facilitate classification, the dimensionality has been reduced using the Mutual Information Quotient (MIQ), a minimum redundancy maximum relevance (MRMR) feature selection algorithm. The data is then used to train a SVM Classifier. The SVM is used to find a discriminant function. The discriminant function can then be used to discriminate between subject data as either HC or PD. The discriminant function design is summarized below in figure 5. The analytical steps of the analysis at hand are explained more precisely the following.

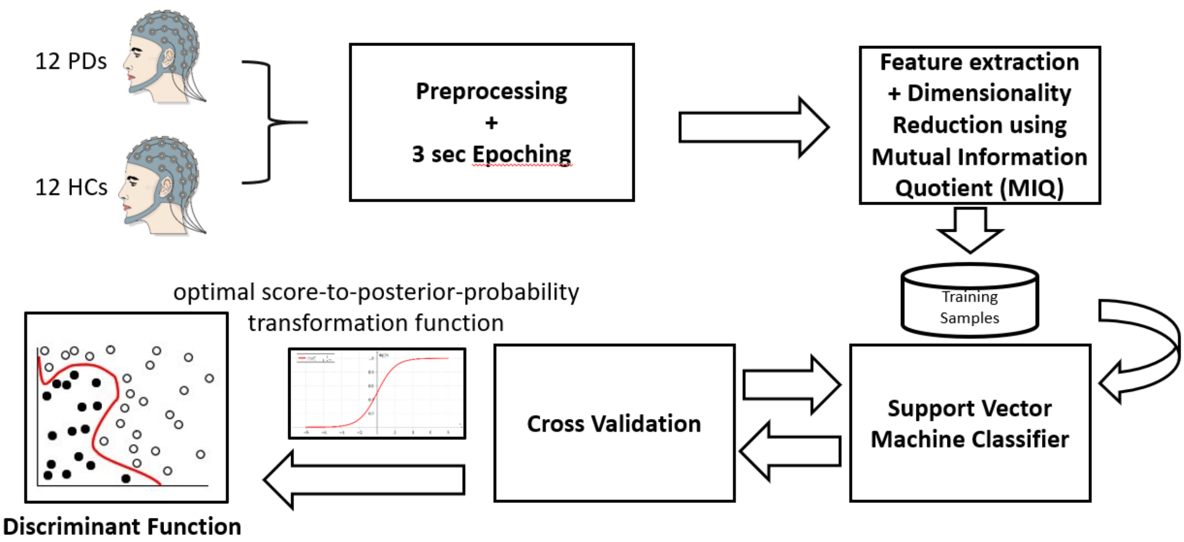

Figure 5: **Discriminant Function Design**

The EEG data of 12 PD and 12 HC (eight thereof artificially synthesized with the "Adasyn" function) are preprocessed including artifact removal and segmented into smaller samples (epochs). Then, the features are extracted and redundant features are removed by the MIQ. The SVM uses only relevant features to separate both groups. Leave-one-Out Cross Validation is used to ensure the creation of the optimal discriminant function for future classification.

3.4.2 Preprocessing

Preprocessing is a crucial step in every ML project to prepare the raw data for analysis and thus to ensure its quality. Within the preprocessing, data can be cleaned from noise and artifacts, reduced in complexity and broken down to data units more manageable in size. Due to the powerful tools used (e.g. filtering), preprocessing can have a direct impact on the success of the analysis and thus needs to be used cautiously (Oliveri *et al.*, 2019). Ultimately, preprocessing is intended to make the data more manageable to analyze, to lower computational cost and to make the results more reliable.

In the present case the data has been preprocessed with help of EEGLAB, an open-source toolbox for EEG analysis by Matlab (Delorme and Makeig, 2004). First, data was band-pass filtered between 1 and 249 Hz for removal of unphysiological frequencies. A notch filter/band-stop filter has been applied at 58-62 Hz and 118-122 Hz for removal of line noise. Data was re-referenced to the reference electrodes on the earlobes and electrooculographic (EOG) artifacts were removed using blind source separation (BSS) (Hyvärinen, Karhunen and Oja, 2001). If necessary, either due to low signal strength or too many artifacts, single channels were interpolated.

Data was segmented into non-overlapping epochs of three seconds using the "regepochs"-function in Matlab. This was done to split up the original coherent EEG recording and to thus generate a sufficient number of observations for analysis. The epoch length of three seconds is a compromise between being long enough to minimize intraindividual statistical variability while at the same time being short enough to exclude most of the changes regarding the subject's state of attention (Möcks and Gasser, 1984). At the same time the chosen epoch lengths reflects the cycle duration of the auditory stimulus or an exact fraction thereof respectively.

Independent Component Analysis (ICA) was performed using the pop_runica.m function. With the help of ICA, it is possible to further reject stereotypical artifacts and to better separate signals from different regions of the brain. This is necessary because single EEG electrodes record mixed signals generated by respectively large brain areas due to the distance of the cortical pyramid cells (generation of the signal) and the electrode (recording of the signal). The ICA can separate the mixed signal into its independent components by separating the maximally temporally independent signals (Makeig *et al.*, 1996). Remaining obvious artifacts have been removed manually.

3.4.3 Feature Extraction

In the following step, the features have been extracted from the preprocessed EEG data. Thereby, each feature is represented by a certain measured value per epoch. Among others, the feature selection includes features related to the frequency domain such as subband powers and ratios thereof, features related to time domain such as Skewness, Kurtosis and Hjorth parameters, and coherency features. As already mentioned above, the feature extraction table in the appendix gives an overview of all extracted features.

In more detail, a total of 72 features has been extracted at 34 channels from each 3-s-epoch of the EEG recordings using a custom written function in Matlab. The feature values have been collected in one complete feature matrix for each condition, e.g. one feature matrix for all recordings of the first 'No Sound' condition, one feature matrix for all recordings of the first 'Rain' condition and so on. The matrices are structured as epochs x features: Within each feature matrix, each row represents one epoch. As such, each row represents three seconds of EEG recording. The epochs are rowed in chronologic order of measurement and respective subjects. In line with this, the first row of the matrix describes the first epoch of the first subject followed by the chronologically adjacent epochs of subject 1. The last epoch of subject 1 is followed by the first epoch of subject 2 and so on. The number of epochs and thus the number of rows of each matrix differs among conditions depending on the exact length of measurement and the number of deleted epochs due to artefacts in preprocessing.

Each column of the matrix represents one of the 72 features at one of the 34 channels. The columns of the matrix are sorted firstly by channel and secondly by feature. Analogously, the first column of the matrix describes channel 1 and feature 1, the second column describes channel 1 and feature 2. The last feature of channel 1 is followed by the first feature of channel 2 and so on. For 72 features at 34 channels this results in a total of 2448 columns. Table 3 exemplarily shows the feature matrix design:

Table 3: **Feature Matrix Design; S = Subject, E = Epoch, Ch = Channel, Feat = Feature**

	Ch 1, Feat 1	**Ch 1, Feat 2**	**...**	**Ch 2, Feat 1**	**...**	**Ch 34, Feat 72**
S 1, E 1						
S 1, E 2						
...						
S 2, E 1						
...						
S 16, E final						

After the extraction of features the data is scaled so that each feature vector has zero mean and unit variance. In other words: all data are transformed onto the same scale. Thereby, different features are made independent of their respective scales and thus comparable. The scaling of the data is especially recommended when a SVM is used for classification like in this paper. This is because the optimal hyperplane as used by the SVM to classify the data is influenced by scale (Jiménez-Cordero and Maldonado, 2020).

The extraction of few features was not possible in entirety and resulted in flawed “Not a Number”-values (NaN) in the feature vector. Several computational functions, however, require complete data matrices and cannot handle missing values. As such, the complete data matrix has been analyzed for missing values appearing as “NaN” (“Not a Number”). Channels where the amount of “NaN” exceeded 18 % of the measured data have been removed from the matrix. The threshold of 18 % has been set by eye after plotting the relative amount of “NaN” in all channels. It has been selected to cut out channels with relevant amounts of “NaN” while keeping as many channels - and thus information - as possible at the same time. In channels where the amount of “NaN” was equal to or less than 18 % the missing values have been interpolated linearly using the Matlab function ‘fillmissing’. In a previous version of feature extraction, the peak frequencies were extracted, too. However, due to a high number of NaN-Values within these features, the peak features were eventually left out completely which resulted in the final number of 72 features extracted. Within those 72 features, the number of NaN-measurements was vanishingly low.

3.4.4 Dimensionality Reduction and Feature Selection

High Dimensionality results in high complexity and thus in high computational cost. Therefore, dimensionality reduction is used to reduce the number of features and thereby the dimensionality of the predictive model. This leaves the classification faster, provides more cost-effective predictors and provides a better understanding of the data generation and classification process (Guyon and De, 2003). In addition to improved efficiency, dimensionality reduction also improves prediction performance by selecting an optimal subset of features for classification. In this sense, a sufficient dimension reduction is important to avoid an overfitting of the classifier, especially if the feature space is big and the sample size is low. In case of an overfit, a classifier is trained too well on training data with a low bias but shows poor performance on unknown testing data with high variance and a loss of accuracy. It is thus unable to generalize and make predictions from a given dataset (Blockeel *et al.*, 2011).

3.4.4.1 Mutual Information Quotient (MIQ)

As mentioned above, a total of 2448 features (72 features x 34 channels) are extracted from each epoch from all five EEG recordings. The mere number of features makes a dimensionality reduction necessary to avoid an overfit. A possible way to perform dimensionality reduction and feature selection is the Mutual Information Quotient (MIQ). MIQ is one possible option to perform a MRMR (Minimum Redundancy Maximum Relevance) feature selection algorithm. To do so, the relevance of each feature is calculated first. The relevance is the mutual information between each feature and the response. Next, the redundancy is calculated as the mutual information between each feature and all other features. The MIQ is calculated as the quotient of relevance and redundancy:

$$\max_{F_i \in \Omega_S} \left\{ I(F_i, H) / \left[\frac{1}{|S|} \sum_{F_j \in S} I(F_i, F_j) \right] \right\}$$

where S represents the feature set that we want to select and |S| represents its cardinality (= number of elements), where $\Omega_S = \Omega - S$ represents the feature subset of all features except those already selected, where $I(F_i, H)$ represents the mutual information between the feature i and the target class label H (relevance), and where $I(F_i, F_j)$ represents the mutual information between the features i and j (redundancy). The higher the MIQ of a feature, the higher its importance in classification. (Gulgezen, Cataltepe and Yu, 2009). MIQ as well as relevance and redundancy are sorted in descending order as exemplarily seen in figure 6.

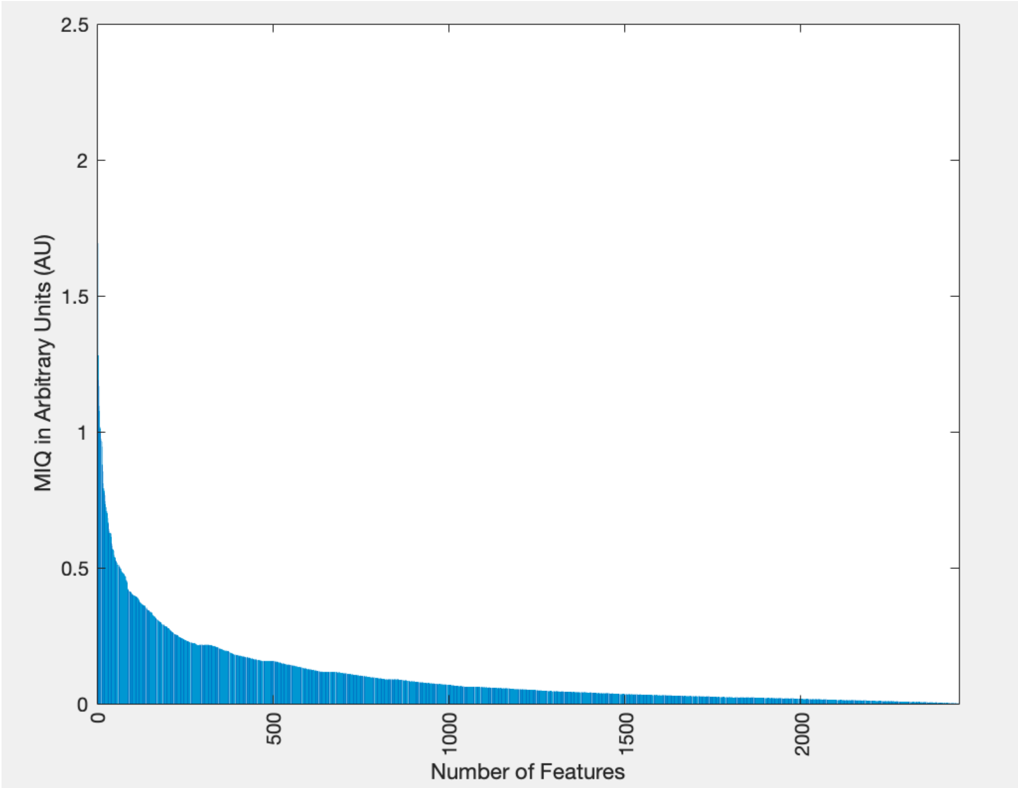

Figure 6: **MIQ Features of Condition Spring Walk Sorted in Descending Order**

All 2048 features (72 features x 34 channels) are sorted in descending order by their MIQ (Relevance/Redundancy). The figure shows considerable differences among the features with an MIQ ranging from 2 to virtually 0. This ranking is the basis for the selection of the optimal feature subset to reach high classification results without risking an overfit of the data.

3.4.4.2 Linear Discriminant Analysis (LDA)

As an alternative approach to dimensionality reduction and feature selection a linear discriminant analysis has been performed and evaluated in addition to the MIQ (Song, Mei and Li, 2010). The analysis has been carried out using a custom-written function in R-Studio based on the Caret ("classification and regression training") package (Kuhn, 2019) and the fpc ("flexible procedures for clustering") package (Hennig, 2020).

LDA reduces dimensions and maximizes the separability among two classes (in this case PD vs. HC) at the same time. It does so by projecting the data onto a lower dimensional feature space (figure 7) (Lavrenko, 2014). The new lower dimensional feature space is defined by the so-called discriminant coordinates (DC) functioning as new coordinate axes. The optimal subspace coordinates (= discriminant coordinates) are obtained by maximizing the between-class variance (μ) and minimizing the within-class variance (σ) to optimally separate both groups:

$$\max \frac{(\mu_1 - \mu_2)^2}{\sigma_1^2 + \sigma_2^2} \ .$$

As such, the discriminant coordinates are linear combinations of the original features. They are obtained by Eigenvectors based on the between-class and within-class covariance matrices, which project the data onto the new dc axis (Xiaozhou, 2020). The Eigenvectors are given out in descending order of their Eigenvalues indicating the portion of information in the corresponding direction. Generally speaking, a larger Eigenvalue indicates better differentiation. Groups are thereby optimally separated in the projected data (Hennig, 2004).

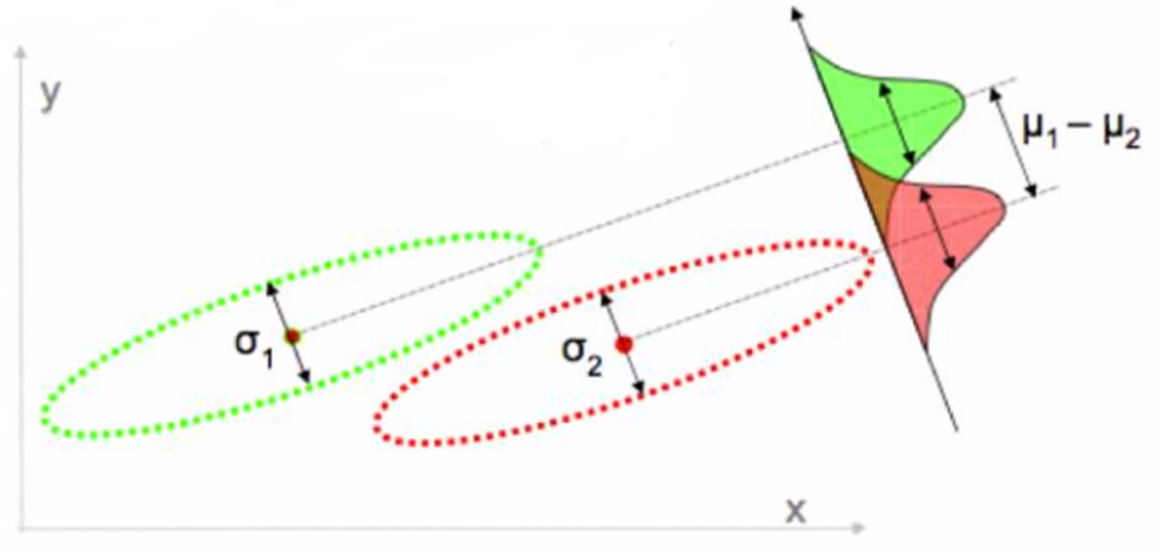

Figure 7: **Schematic Projection of Measurements to a Lower Dimensional Feature Space by Linear Discriminant Analysis (LDA)**

The Within-Class Variance (σ) is minimized and the Between-Class Variance (μ) is maximized in order to find New Coordinate Axes for optimal separation of groups in a lower dimensional feature space (Lavrenko, 2014)

However, the analysis based on features selected by LDA did not show satisfying classification results. As such, after validating the results by an alternative feature selection, MIQ has been chosen as feature selection algorithm in this analysis.

3.4.4.3 Adaptive Synthetic Sampling (ADASYN)

Most of the existing classification mechanisms assume an even distribution of the data between classes in order to work optimally. In many cases, however, data is unevenly distributed among the classes. Such a class imbalance might lead to a shift of the classification decision boundary towards the majority class. This shift in turn might cause the performance of the classifier to deteriorate (Ali, Shamsuddin and Ralescu, 2015). Notably, an imbalanced data set of four HC and 12 PD has been collected in this study.

Different approaches have been suggested to deal with imbalanced datasets including different sampling methods and algorithm level methods (Kotsiantis, Kanellopoulos and Pintelas, 2006). In this paper an algorithm level method has been used to avoid a bias introduced by the class imbalance. The adaptive synthetic sample approach (ADASYN) algorithm synthetically creates new examples from the minority class via linear interpolation between existing minority class examples and thus improves class balance (Siedhoff, 2020). This approach has been proposed in the paper of He et al. (He *et al.*, 2008).

3.4.4.4 Selection of Feature Subset

After sorting all features according to their importance for classification by the MIQ it is necessary to select a subset thereof to be used by the classifier to avoid overfitting. Different approaches to this selection can be found in the literature. These include mathematical approaches like the selection of the point of inflection on the curve ("knee" or "elbow") (Ketchen and Shook, 1996), linear regression-based methods (Hasan, Hasan and Mottalib, 2015) or approaches based on professional intuition, sometimes also called expert knowledge-based feature selection (Uribe and Isaza, 2012).

In many cases the selection of a feature subset can be justified by a reasonable accuracy of the classifier result. This way, several different combinations of features can be suitably chosen. As the ranking of features according to MIQ can differ significantly among the five conditions, it has been tried in the present study to choose a consistent approach for selection in each condition to achieve the best comparability possible while obtaining an optimal testing accuracy at the same time. This has been achieved via a custom-written feature selection function: similar to a sequential forward selection, a for-loop has been used to add one MIQ feature into selection each round for the 200 most important features starting with just one feature in the first round. As such, 200 feature subsets from n=1 to n=200 have been tested to compare the resulting testing accuracies and confusion matrices. Finally, the false positive rate has been plotted against the true positive rate. In the resulting scatter plot, the specific number of features has been chosen which provided for the highest accuracy (= true positive rate) and the lowest false positive rate at the same time. This has been done to select a feature subset where a high testing accuracy is not achieved by an unreasonably increased false positive rate through a high number of features.

Figure 8 below exemplarily shows the scatter plot of the first rain condition. The arrow points at the optimal combination of high accuracy (= true positive rate, y-axis) and a low false positive rate (x-axis). The respective features subset of 118 feature has been chosen in this case as can be seen in the results section.

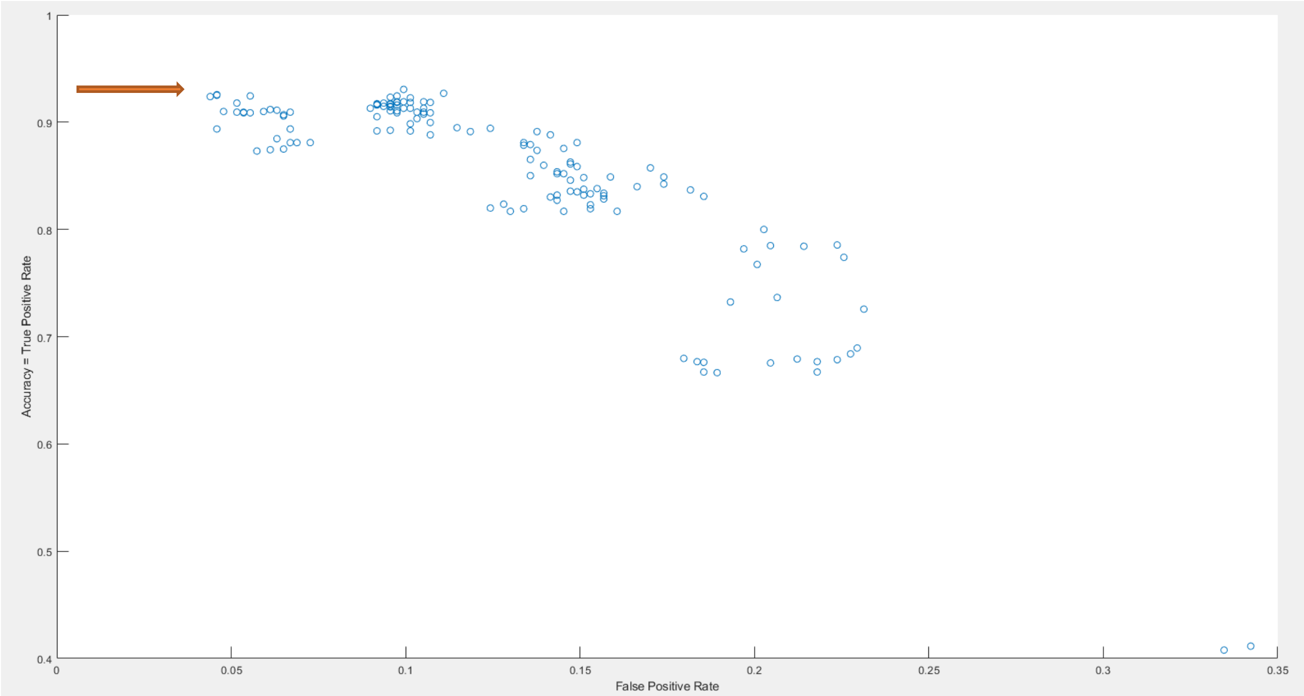

Figure 8: **Scatter Plot of True and False Positive Rates for Selection of an Optimal Feature Subset, Example taken from First Rain Condition**

N = Number of features used for classification
The Scatter Plot shows the classification results of all 200 possible feature subsets from n = 1 to n = 200 with their respective false positive rates and true positive rates (= accuracy). The feature subset with the highest accuracy and the lowest false positive rate has been chosen for classification.

3.4.5 Support Vector Machine and Classification of Data as either Patients or Healthy Controls

Generally speaking, a classification algorithm consists of three layers: Training, testing and classification. A part of the collected data is used to train the algorithm. Subsequently, another part of the data is used for validation and thus to optimize the algorithm. As a last step, the algorithm is used on unknown data for testing. In this paper, a SVM is used for classification to optimally separate the data as either HC or patients with PD. The SVM algorithm has been chosen due to the capability to classify future unseen data and the good generalization performance (Behzad *et al.*, 2009). In addition, an adequate sample size is important for reasonable predictions and thus classification. In this paper, every epoch can be seen as a sample. When comparing literature, it is often said that for uncorrelated features, the optimal features size is at least N-1, where N is the sample size (Hua *et al.*, 2005).

A crucial concept behind the idea of SVMs is the use of soft margins for classification. In contrast to soft margins as used by the SVM, hard margins are defined as the maximum distance to a threshold set between the two observations at the extreme end of each group towards the other group (e.g. Maximal Margin Classifiers). Consequently, hard margins are very susceptible to single observations close to the other group, so-called outliers, which shift and thus distort the threshold. If data is not completely linearly separable the results of the classifier are a lot less convincing. Soft margins thus allow for a certain number of misclassifications to render the classifier less sensitive to outliers and to determine a reasonable classification threshold.

Soft margins are defined as the distance to a threshold set between observations of both groups that are not at the extreme end. Hereby, outliers are misclassified but excluded from the determination of the classification threshold. Hence, the classifier is more accurate for the whole dataset by misclassifying few observations at the extreme end of both groups. After training the algorithm, the optimal soft margin is eventually determined by chosing as few misclassifications as possible. Technically, the optimal soft margin is found by cross validation of training data to achieve the best ratio of classification accuracy and misclassifications. Hereby, different parts of the data set are used for training in an *iterative* way to select the optimal set for training. In this paper, the so-called "leave-on-out" cross validation has been used. As such, for every subject, all other data is used for training. This is described as an appropriate approach for smaller datasets like in this case (Starmer, 2022).

The observations of each group determining the soft margins and the observations within the margin are called support vectors. Classification by support vectors is called support vector *classifier*. The observations of both groups can thus be separated along a threshold found by support vectors. If the data is two-dimensional the threshold is a one-dimensional line. If it is three-dimensional it is separated by a two-dimensional plane. If the data is in four or more dimensions, it is separated by a so-called hyperplane. Generally speaking, n-dimensional data is separated by a hyperplane with the dimensions n-1.

If data is difficult to be classified along the original axes it can be transformed to find a support vector classifier in a higher dimension. A simple example for transformation would be to square the data. The data can then be classified by support vectors along the new axis of squared values. Squaring the data, however, is just one possible example for the transformation. The analysis of possible transformations to find support vectors in new dimensions is done by a support vector *machine*.

To find a functioning support vector *classifier*, a support vector *machine* uses a Kernel function. A Kernel function systematically analyzes possible transformations of the data without computing the actual transformation. It is thereby possible to analyze a wide range of possible transformations in a time and cost-effective way. There are different Kernel functions such as the linear, the polynomial or the radial Kernel. In this paper a linear Kernel has been used. When a support vector classifier is found, the data can be optimally separated into two categories (Boser, Guyon and Vapnik, 1992).

4 Results

The results of this study will be presented in two parts: The first part will focus on the feature selection and show the most important features used to discriminate PD patients from HC. The second part of the results section will focus on the classification-results based on the features presented in the first section.

4.1 The Most Important Features for Classification

In the first part of the results section, the most important features for discrimination will be shown for each of the five sound conditions. For better interpretability and better visibility of the results, this is done by calculating the mean of the channel values. To get an overview of each condition, the mean of *all channels* has been calculated first. It is thereby possible to get an impression of the feature importance irrespective of the location of measurement. However, the importance of features may vary significantly depending on the location where the EEG is measured as described in 2.5. As a following step, it is therefore interesting to look at the mean feature values *within different regions of the scalp* and the importance of features within these areas respectively. Different approaches to defining areas of the sculp have been made. In this paper, an approach of seven areas (frontal, left temporal, right temporal, central, left parietal, right parietal and occipital) has been chosen, a slightly modified version of the approach of Ahani et al. (Ahani *et al.*, 2014). These respective areas are listed in table 4 and visualized in figure 9.

Complete tables showing the MIQ of the mean of all 72 features over all 34 channels as well as for each scalp region separately can be found in the appendix for all five conditions.

Table 4: **Regions of the Scalp and their Respective Electrodes**

Region	Electrodes
Frontal	FP1, FPZ, FP2, FZ
Temporal Left	F7, F3, FC5, T7, CP5, P7
Temporal Right	F8, F4, FC6, T8, CP6, P8
Central	FC1, FCZ, FC2, C3, CZ, C4
Parietal Left	CP1, CPZ, PZ, P3
Parietal Right	CP2, CPZ, PZ, P4
Occipital	PO5, POZ, PO6, O1, OZ, O2

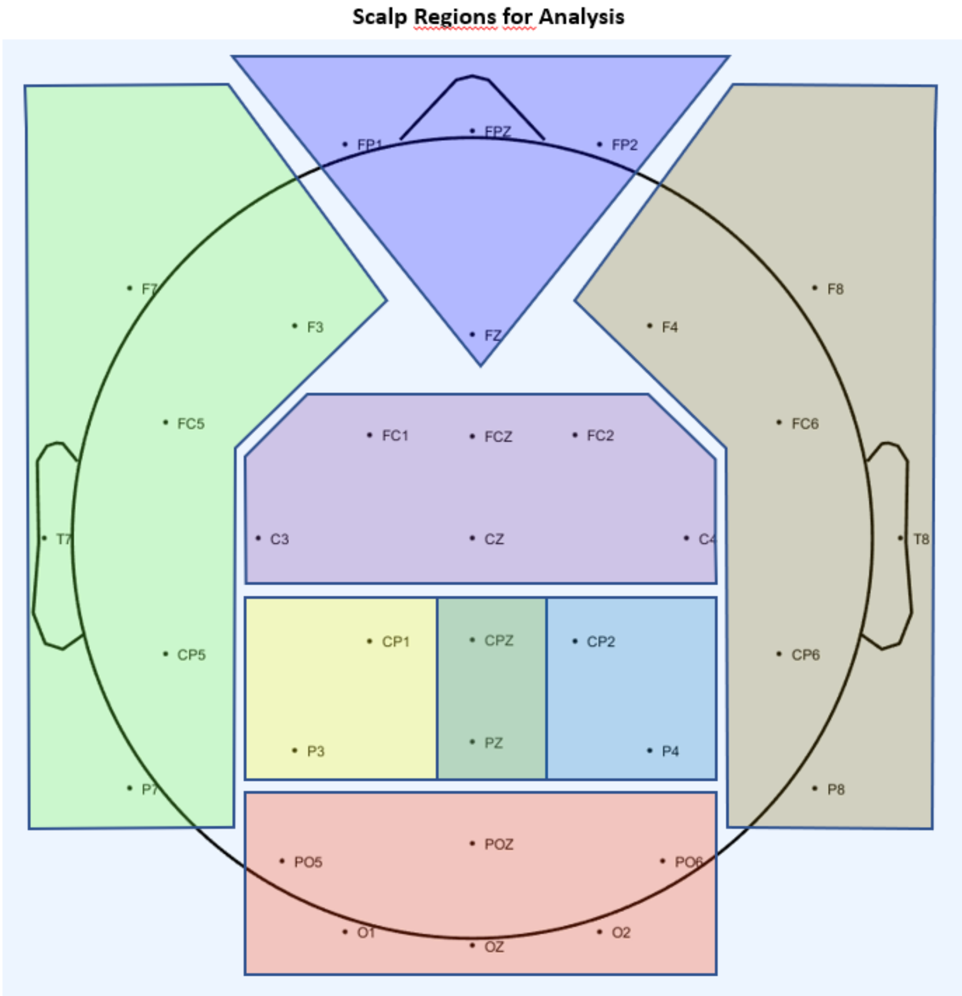

Figure 9: **Scalp Regions for Analysis**

The seven regions of the scalp which are used for analysis in this study as projected over the electrodes, a modified version of Ahani's approach (Ahani *et al.*, 2014)
F = Frontal, C = Central, P = Parietal, T = Temporal, O = Occipital

4.1.1 Condition 1: No Sound 1

4.1.1.1 Mean of All Channels

Figure 10 below shows the MIQ of all 72 features and, in more detail, of the top five features (inlay) given the mean values for the first condition in resting state without any auditory stimulus (No Sound 1). A full table listing all 72 features as ranked by the MIQ can be found in the appendix.

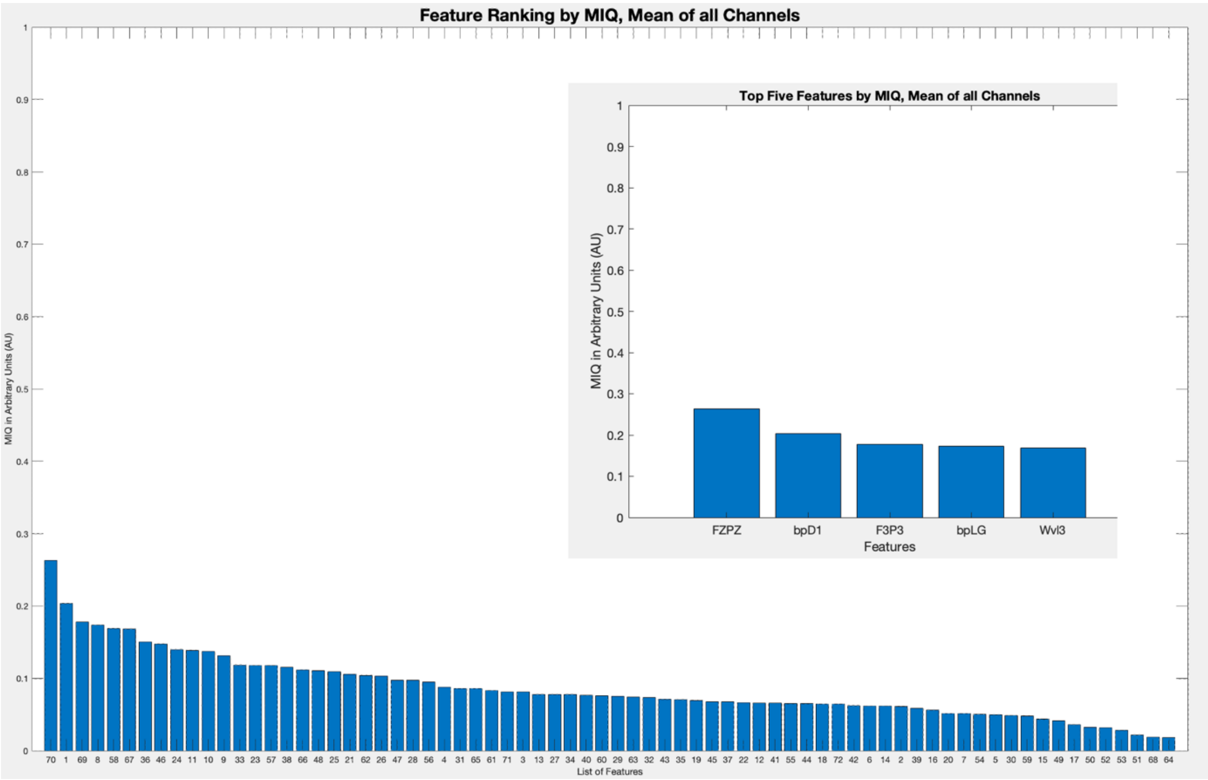

Figure 10: **Mutual Information Quotient (MIQ) of all 72 Features and top 5 Features (Inlay) in Condition 1 (No Sound 1), Mean over all 34 Channels**

All 72 features are ranked in importance by the MIQ, given the mean of all 34 channels. The inlay shows the top five most important features out of all 72 in more detail.
FZPZ = Phase Lag Index of Central Electrodes, bpD1 = Band Power of Delta 1 (0,5-2 Hz), F3P3 = Phase Lag Index of Left Hemispheric Electrodes bpLG = Band Power of Low Gamma (30-60 Hz), Wvl3 = Wavelet Coefficient Level 3

Generally speaking, most of the features are ranked with a MIQ between 0,1 and 0,25 arbitrary units (AU) as seen in figure 10. By visual interpretation, the elbow of the curve shows six features as most important. Among these, the PLI seems to be the most important feature as it is ranked first (0,25 AU) and third (0,18 AU). Together with the coherency feature ranked sixth, there are three features of synchronized interactions between neural signals in the top feature group. From the PLI features, the phase lag between the central electrodes (FZ PZ) and between the electrodes of the left hemisphere (F3 P3) are most important. Coherence is most important between the parietal electrodes (P3 P4).

Also features analyzing spectral power seem relevant as the band power of delta 1 is ranked second, the low gamma band is the fourth most important feature.

4.1.1.2 Mean of Channels per Region of the Scalp

Based on figure 9, "Scalp Regions for Analysis", figure 11 below visualizes the top five most important features per region of the scalp for the first condition resting state ("No Sound 1"). Figure 12 shows the respective MIQ values as subplots.

For coherency features, the PLI for the electrodes FZ-PZ is most important in the areas temporal left, parietal left and occipital. It is the second most important feature in the areas temporal right, parietal right and frontal. It is ranked fourth in the central area. The PLI for the electrodes F3-P3 is the second most important feature in the parietal left and the occipital area. It is also listed in the temporal left and parietal right area.

For spectral features, the low-gamma frequency band is ranked second in the temporal left area. Low epsilon is ranked fifth in the frontal area, delta 1 is ranked fifth in the temporal right area. The spectral value of the center frequency in the delta-band (SFc1) is ranked most important in the temporal right and central area. It is also ranked fourth in the parietal right area. The Delta Slow Wave Index (DSI) is the most important feature in the parietal right area.

Top Five Features Per Region

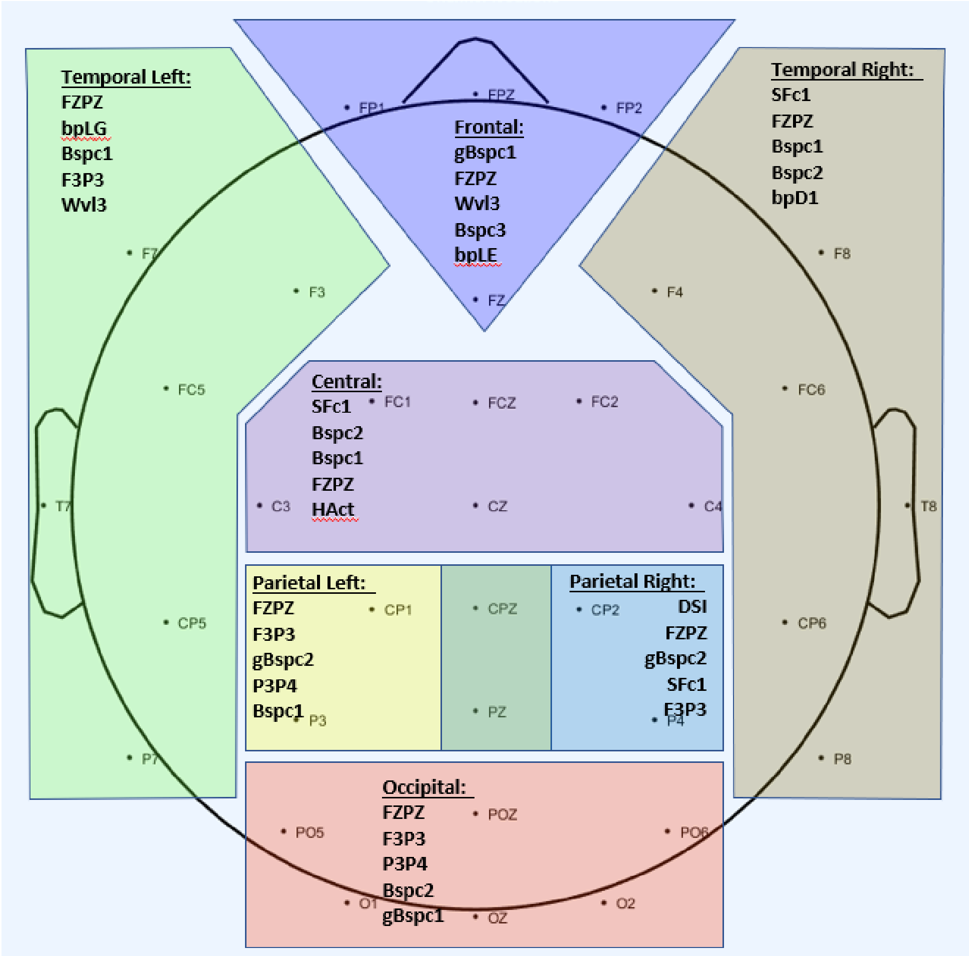

Figure 11: **Visualization of the Top Five Most Important Features per Region of the Scalp for Condition No Sound 1**

Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2Hz), bpLE = Band Power of Low Epsilon (91-120 Hz), bpLG = Band Power of Low Gamma (30-60 Hz), Bspc = Absolute value Bispectrum Time Series, DSI = Delta Slow Wave Index, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, FZPZ = Phase Lag Index of Central Electrodes, gBspc = Phase Angle Bispectrum Time Series, HAct = Hjorth Activity, SFc1 = Spectral Value at Center Frequency, Wvl = Wavelet Coefficient

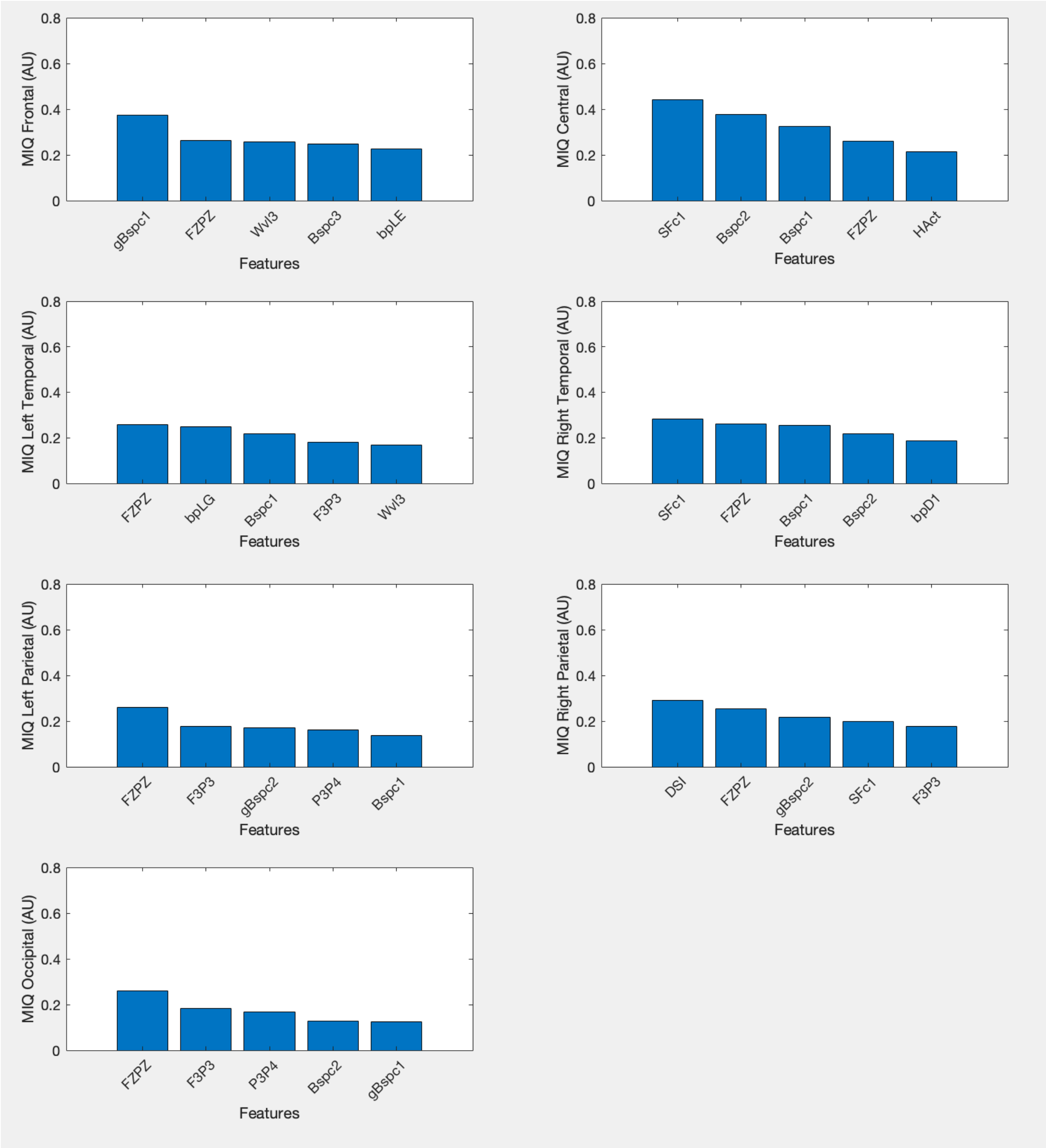

Figure 12: **Subplots MIQ of the Top Five Features per Region of the Scalp for Condition No Sound 1**

AU = Artificial Units

Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), bpLE = Band Power of Low Epsilon (91-120 Hz), bpLG = Band Power of Low Gamma (30-60 Hz), Bspc = Absolute value Bispectrum Time Series, DSI = Delta Slow Wave Index, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, FZPZ = Phase Lag Index of Central Electrodes, gBspc = Phase Angle Bispectrum Time Series, HAct = Hjorth Activity, SFc1 = Spectral Value at Center Frequency, Wvl = Wavelet Coefficient

4.1.2 Condition 2: Rain 1

4.1.2.1 Mean of All Channels

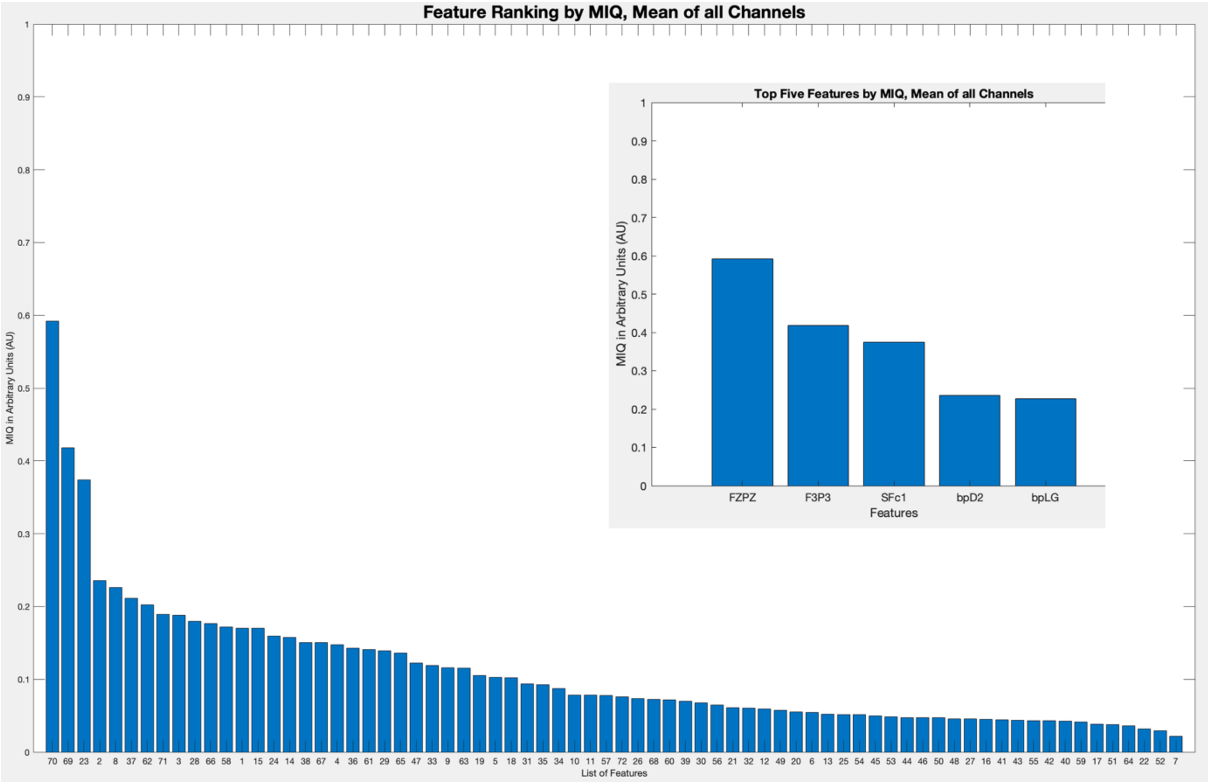

Figure 13: **Mutual Information Quotient (MIQ) of all 72 Features and top 5 Features (Inlay) in Condition 2 (Rain 1), Mean over all 34 Channels**

All 72 features are ranked in importance by the MIQ, given the mean of all 34 channels. The inlay shows the top five most important features out of all 72 in more detail.
FZPZ = Phase Lag Index of Central Electrodes, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, SFc1 = Spectral Value at Center Frequency, bpD2 = Band Power of Delta 2 (2-4 Hz), bpLG = Band Power of Low Gamma (30-60 Hz)

Figure 13 above shows the MIQ of all 72 features and, as an inlay, of the top five features given the mean values for the second condition Rain 1, with subjects listening to the first and rather rhythmic modulation of rain sound. A full table listing all 72 features as ranked by the MIQ can be found in the appendix.

The MIQ features are ranked between 0,05 and 0,6 AU. Most of the features have a MIQ between 0,1 and 0,2 AU. Only five features clearly exceed 0,2 AU and can thus be regarded as the most important features in this condition. Among these, the PLI is most important with the PLI between the central electrodes (FZ PZ) and the left hemispheric electrodes (F3 P3) being the two most important features.

For spectral features, SFc1 as the spectral value at the center frequency of delta is the third most important feature, the band power of delta 2 is ranked fourth. The band power of the low gamma band is the fifth most important feature for separating classes in this condition. As the third and fourth most important features are connected to the delta band, it deserves mentioning that the delta-slow wave index is ranked as number 10, underlining the central role of the delta band in this condition.

4.1.2.2 Mean of Channels per Region of the Scalp

Figure 14 below visualizes the top five most important features per region of the scalp for the second condition. Figure 15 shows the five most important features per region as subplots.

Features representing synchronized interaction are of central importance in all areas of the scalp. The PLI for the central electrodes FZ-PZ is the most important feature in all seven areas. The PLI for the left hemispheric electrodes F3-P3 is the second most important feature in six of the seven regions, it is ranked third only in the parietal right area. The PLI for the right hemispheric electrodes F4-P4 is among the top five features for temporal right, parietal right and occipital area. Coherency of F3-F4 is listed in the temporal right and the occipital area.

The spectral value at the center frequency of delta (SFc1) is listed in all areas except the two temporal areas. It is ranked second in the parietal right area and third in the parietal left as well as occipital area. Similarly, the band power of delta 2 (2-4 Hz) is listed in the central area. In line with this, the DSI is listed in the frontal and parietal right area. High Gamma (61-90 Hz) is listed in the temporal left area.

Top Five Features Per Region

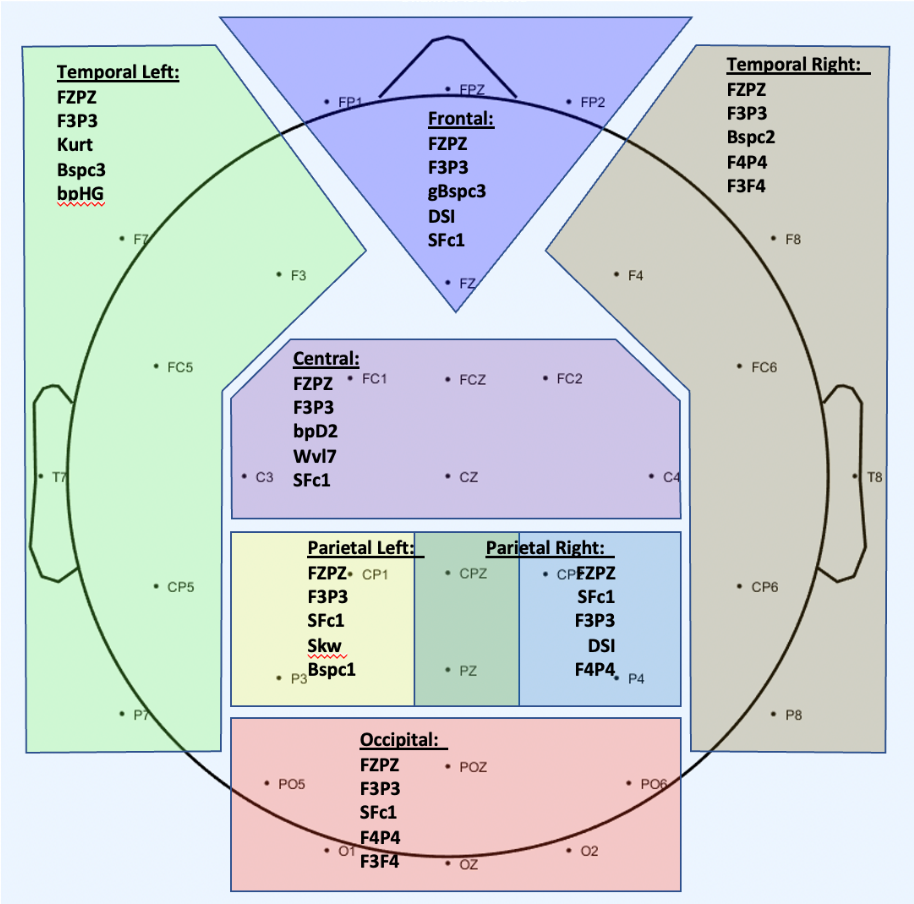

Figure 14: **Visualization of the Top Five Most Important Features per Region of the Scalp for Condition Rain 1**

Feature Abbreviations in alphabetical order: bpD2 = Band Power of Delta 2 (2-4 Hz), bpHG = Band Power of High Gamma (61-90 Hz), Bspc = Absolute value Bispectrum Time Series, DSI = Delta Slow Wave Index, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, FZPZ = Phase Lag Index of Central Electrodes, F4P4 = Phase Lag Index of Right Hemispheric Electrodes, gBspc = Phase Angle Bispectrum Time Series, Kurt = Kurtosis, SFc1 = Spectral Value at Center Frequency, Skw = Skewness, Wvl = Wavelet Coefficient

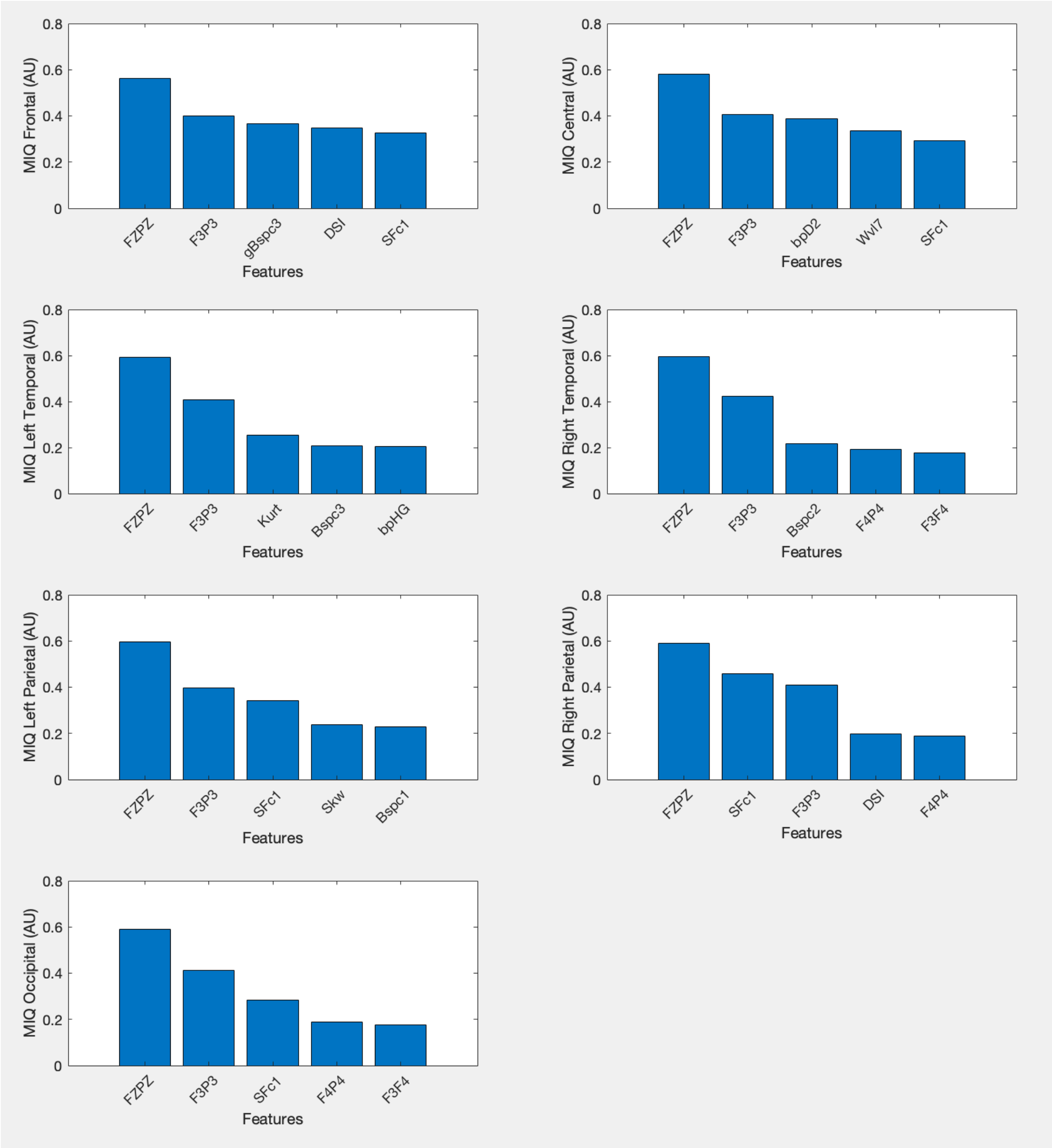

Figure 15: **Subplot of Top Five MIQ Features per Region of the Scalp for Condition Rain 1**

AU = Artificial Units
Feature Abbreviations in alphabetical order: bpD2 = Band Power of Delta 2 (2-4 Hz), bpHG = Band Power of High Gamma (61-90 Hz), Bspc = Absolute value Bispectrum Time Series, DSI = Delta Slow Wave Index, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, FZPZ = Phase Lag Index of Central Electrodes, F4P4 = Phase Lag Index of Right Hemispheric Electrodes, gBspc = Phase Angle Bispectrum Time Series, Kurt = Kurtosis, SFc1 = Spectral Value at Center Frequency, Skw = Skewness, Wvl = Wavelet Coefficient

4.1.3 Condition 3: Spring Walk

4.1.3.1 Mean of All Channels

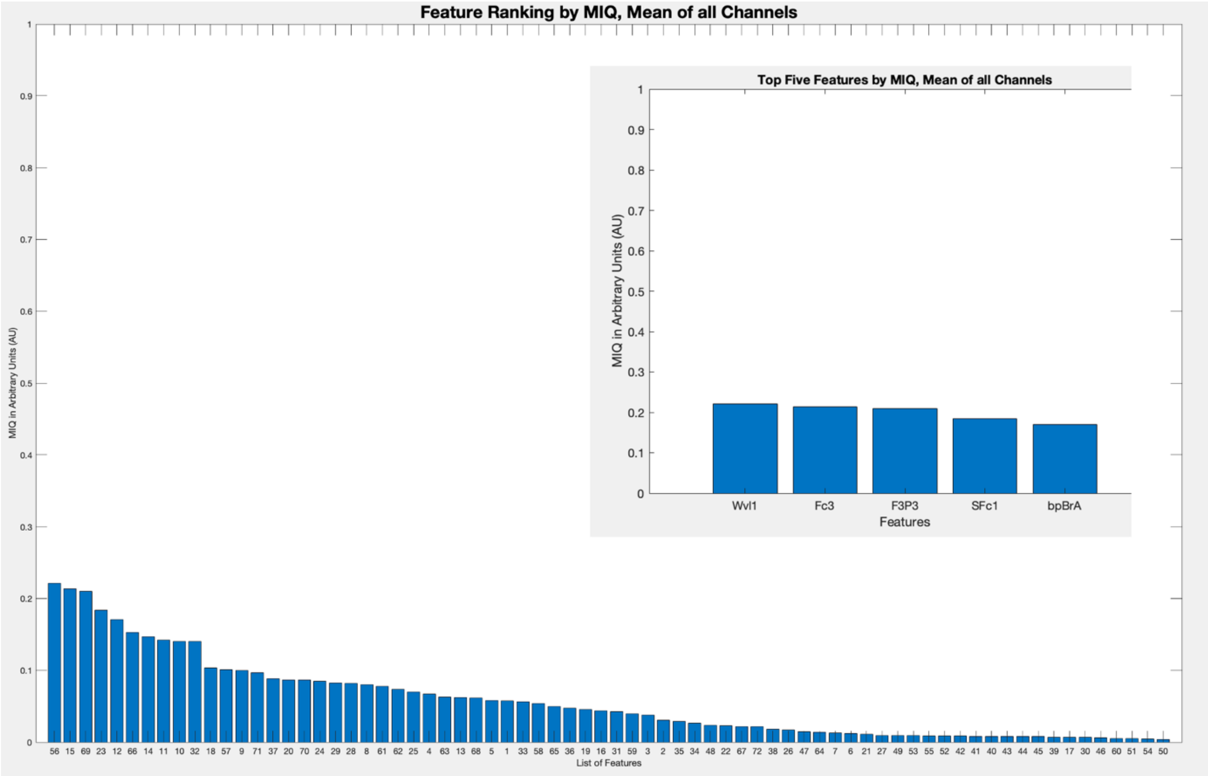

Figure 16: **Mutual Information Quotient (MIQ) of all 72 Features and top 5 Features (Inlay) in Condition 3 (Spring Walk), Mean over all 34 Channels**

All 72 features are ranked in importance by the MIQ, given the mean of all 34 channels. The inlay shows the top five most important features out of all 72 in more detail.
Wvl = Wavelet Coefficient, Fc3 = Center Frequency, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, SFc1 = Spectral Value at Center Frequency, bpBrA = Band Power Broadband Act (151-249 Hz)

Figure 16 above shows the MIQ of all 72 features as well as the top five features given the mean values for the third condition Spring Walk, subjects listening to the more complex sound of a Spring Walk. This sound is rather unrhythmic. A full table listing all 72 features as ranked by the MIQ can be found in the appendix.

Generally, single features seem to have less importance for classification in this condition. The MIQ ranges from close to 0 to 0,2 AU. By visual interpretation, the three most important features seem to be most relevant as a first group with a little more than 0,2 AU. A second group with seven features ranging from 0,15-0,175 AU deserves attention as well. The rest of the features does not exceed 0,1 AU.

The most important feature for discrimination is the wavelet analysis at decomposition level 1. This reflects a wavelet decomposition of higher oscillation in the frequency of 126-250 Hz. The second most important feature is the central frequency of the alpha band, the third most important feature is the

PLI of the left hemispheric electrodes. As for the second group, the spectral value at the center frequency of the delta band is the fourth most important feature. In this condition, bands of higher frequencies seem relevant, too, as the band power of the broadband act (151-249 Hz), high epsilon (121-150 Hz), low epsilon (91-120 Hz) and high gamma (61-90 Hz) are listed among the top ten frequencies. The importance of the band power of the broadband act might be seen in line with the most important feature, the wavelet analysis at decomposition level 1. The center frequency of the theta band (4-8 Hz) is ranked seventh. The coherence between the frontal electrodes (F3 F4) and the PLI of the right hemispheric electrodes (F4 P4) are listed as well.

4.1.3.2 Mean of Channels per Region of the Scalp

Figure 17 below visualizes the top five most important features per region of the scalp for the third condition Spring Walk, figure 18 shows the five most important features per region as subplots.

The center frequency of the alpha band (Fc3) is the most important feature in the central, parietal left and parietal right region of the scalp. It is ranked 3rd in the frontal and temporal left area. The band power of delta is important in the occipital and the parietal right area. The band powers from low epsilon to broadband act are especially important in the central area. The band power of broadband act is the most important feature in the frontal region and also listed in the temporal right area.

The PLI for the left hemispheric electrodes F3-P3 is most important in the temporal left area and the occipital area. It is the second most important feature in the frontal, temporal right and the two parietal areas of the scalp. Coherency between the frontal electrodes F3-F4 is important in the temporal right, the parietal left, the parietal right and the occipital area.

The wavelet analysis at decomposition level 1 is listed as a top feature in the central, temporal left, temporal right and frontal area.

Generally speaking, there is noticeable heterogeneity between the different areas. This is in line with the MIQ not showing a focus on certain features. The features listed as most important for the regions of the scalp center around a MIQ of 0,2 as seen in figure 18.

Top Five Features Per Region

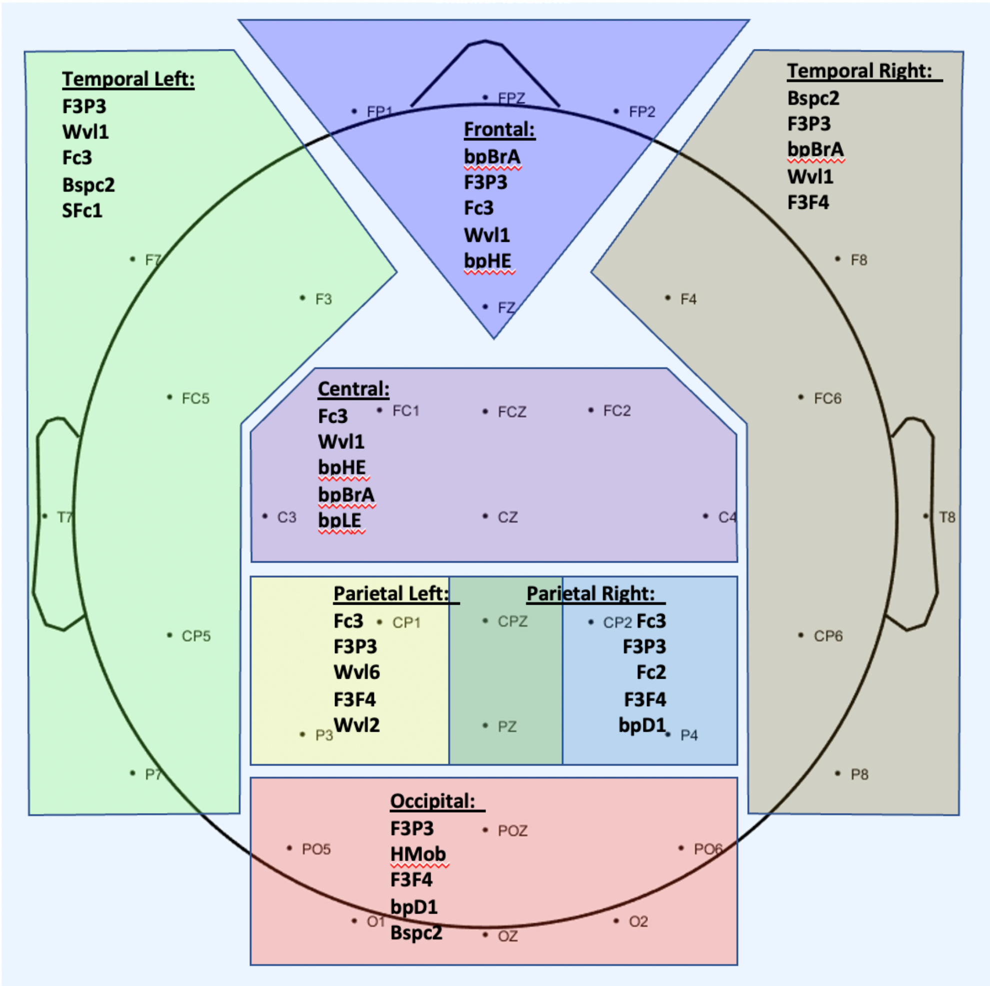

Figure 17: **Visualization of the Top Five Most Important Features per Region of the Scalp for Condition Spring Walk**

Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), bpBrA = Band Power of Broadband Act (151-249 Hz), bpHE = Band Power High Epsilon (121-150 Hz), bpLE = Band Power Low Epsilon (91-120 Hz), Bspc = Bispectrum Time Series, Fc = Center Frequency, F3F4 = Coherence of Frontal Electrodes F3 F4, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, HMob = Hjorth Mobility, SFc1 = Spectral Value at Center Frequency, Wvl = Wavelet Coefficient

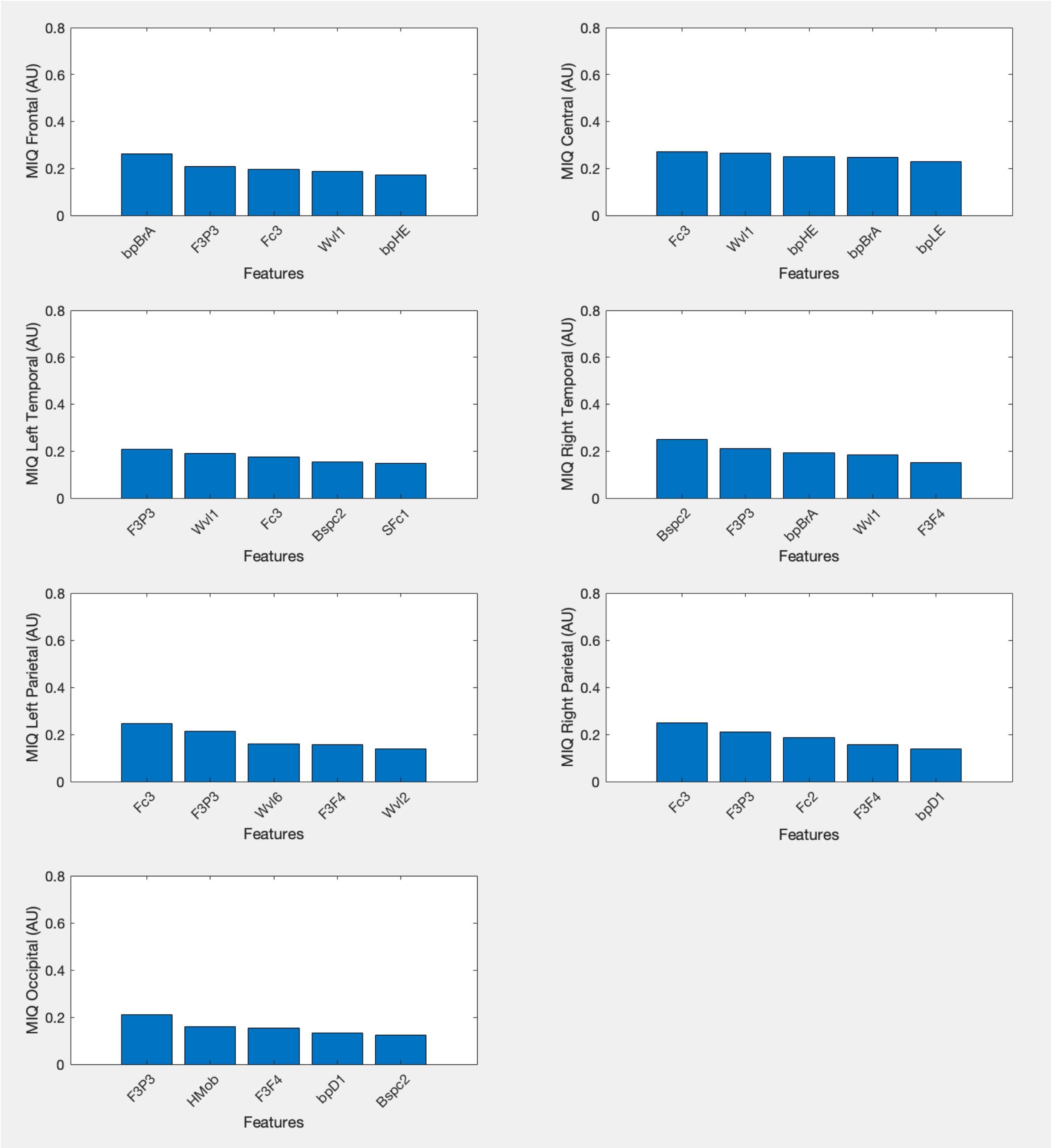

Figure 18: **Subplot of Top Five MIQ Features per Region of the Scalp for Condition Spring Walk**

AU = Artificial Units
Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), bpBrA = Band Power of Broadband Act (151-249 Hz), bpHE = Band Power High Epsilon (121-150 Hz), bpLE = Band Power Low Epsilon (91-120 Hz), Bspc = Bispectrum Time Series, Fc = Center Frequency, F4F4 = Coherence of Frontal Electrodes F3 F4, F3P3 = Phase Lag Index of Left Hemispheric Electrodes, HMob = Hjorth Mobility, SFc1 = Spectral Value at Center Frequency, Wvl = Wavelet Coefficient

4.1.4 Condition 4: Rain 2

4.1.4.1 Mean of All Channels

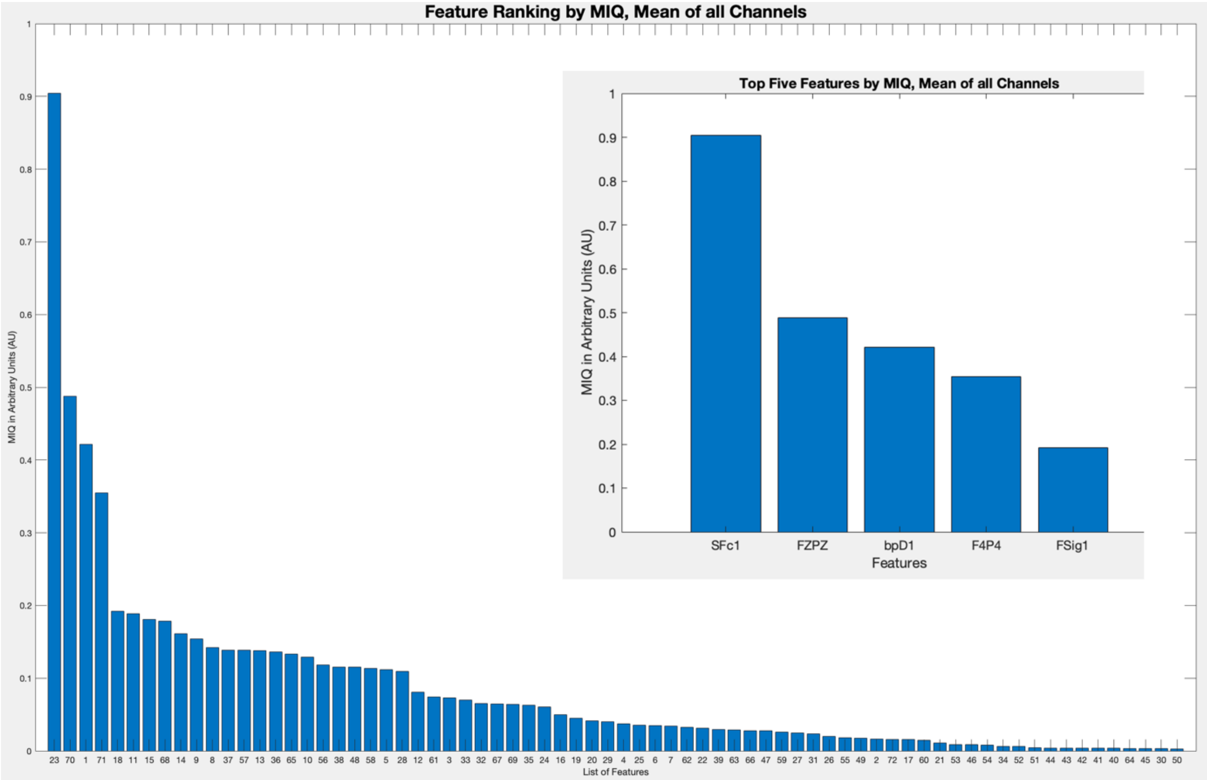

Figure 19: **Mutual Information Quotient (MIQ) of all 72 Features and top 5 Features (Inlay) in Condition 4 (Rain 2), Mean over all 34 Channels**

All 72 features are ranked in importance by the MIQ, given the mean of all 34 channels. The inlay shows the top five most important features out of all 72 in more detail.
SFc1 = Spectral Value at Center Frequency, FZPZ = Phase Lag Index of Central Electrodes, bpD1 = Band Power of Delta 1 (0,5-2 Hz), F4P4 = Phase Lag Index of Right Hemispheric Electrodes, FSig1 = Bandwidth of Delta

Figure 19 above shows the MIQ of all 72 features given the mean values for the fourth condition (Rain 2), a rather slow and non-rhythmic version of the Rain sound. The MIQ of all channels shows a clear difference among the single features. By visual interpretation of the curve, four features are of central importance for discriminating both groups. The center frequency in the alpha band is by far the most important feature with an MIQ exceeding 0,9 AU. The second most important feature is the PLI of the central electrodes FZPZ reaching an MIQ of 0,5 AU. The band power of delta 1 (0,5-2 Hz) and the PLI of the right hemispheric electrodes (F4 P4) are features three and four. Another four features deserve mentioning with an MIQ around 0,2: the bandwidth of the delta band, the band power of high epsilon, the center frequency of the alpha band and the coherency between the central channels C3 and C4. A full table listing all 72 features as ranked by the MIQ can be found in the appendix.

4.1.4.2 Mean of Channels per Region of the Scalp

Figure 20 below visualizes the top five most important features per region of the scalp for the fourth condition. Figure 21 shows the five most important features per region as subplots.

The spectral value of the central frequency in the delta-band (SFc1) is the most important feature in the temporal right, central, parietal left and occipital region. It is the second most important feature in the temporal left and parietal right area and ranked fourth in the frontal area. Accordingly, the band-power of delta 1 (0,5-2 Hz) is listed among the top five features in all seven areas of the scalp. The bandwidth of the delta band is ranked in the temporal right area.

The PLI for the central electrodes FZ-PZ is the most important feature in the temporal left, frontal and parietal right area. It is listed second most important in the temporal right, the central, the parietal left and the occipital area. In addition, the PLI for the right hemispheric electrodes F4-P4 is ranked second in the frontal area and among the top five most important features in all seven regions.

The MIQ of the most important features ranges from 0,2 to 0,7 with the center frequency of delta being especially important in the right temporal and the occipital area.

Top Five Features Per Region

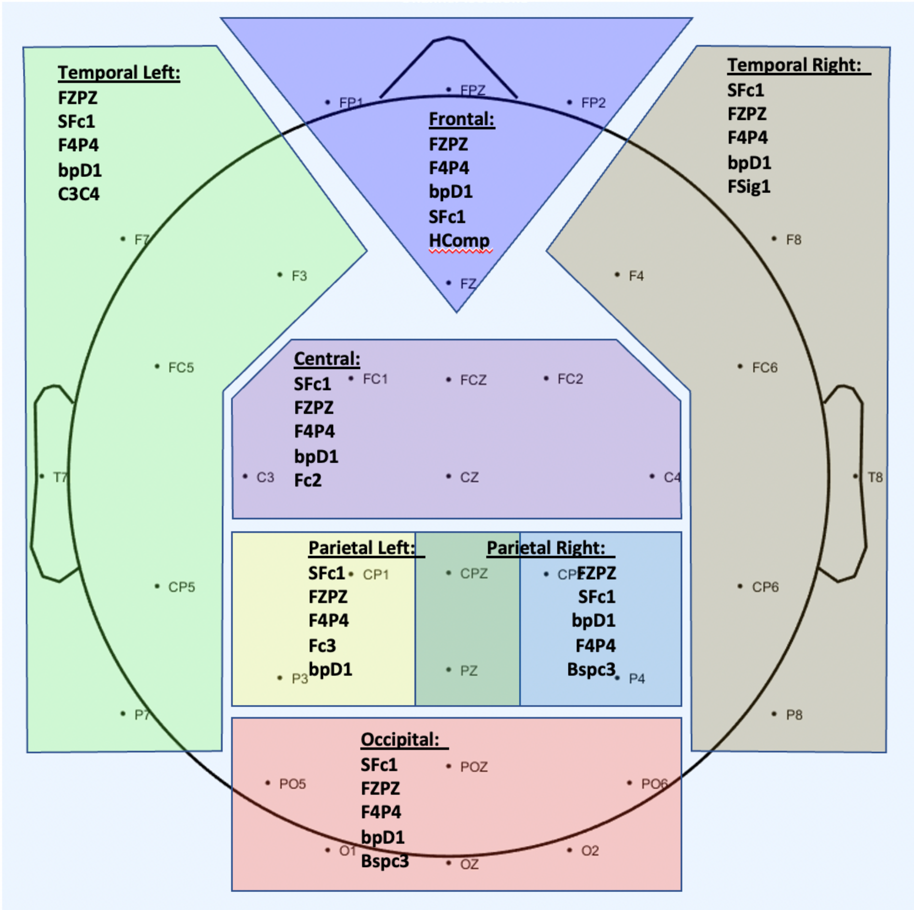

Figure 20: **Visualization of the Top Five Most Important Features per Region of the Scalp for Condition Rain 2**

Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), Bspc = Absolute value Bispectrum Time Series, C3C4 = Coherence of central electrodes C3 C4, Fc2 = Center frequency, FZPZ = Phase Lag Index of Central Electrodes, F4P4 = Phase Lag Index of Right Hemispheric Electrodes, HComp = Hjorth Complexity, SFc1 = Spectral Value at Center Frequency

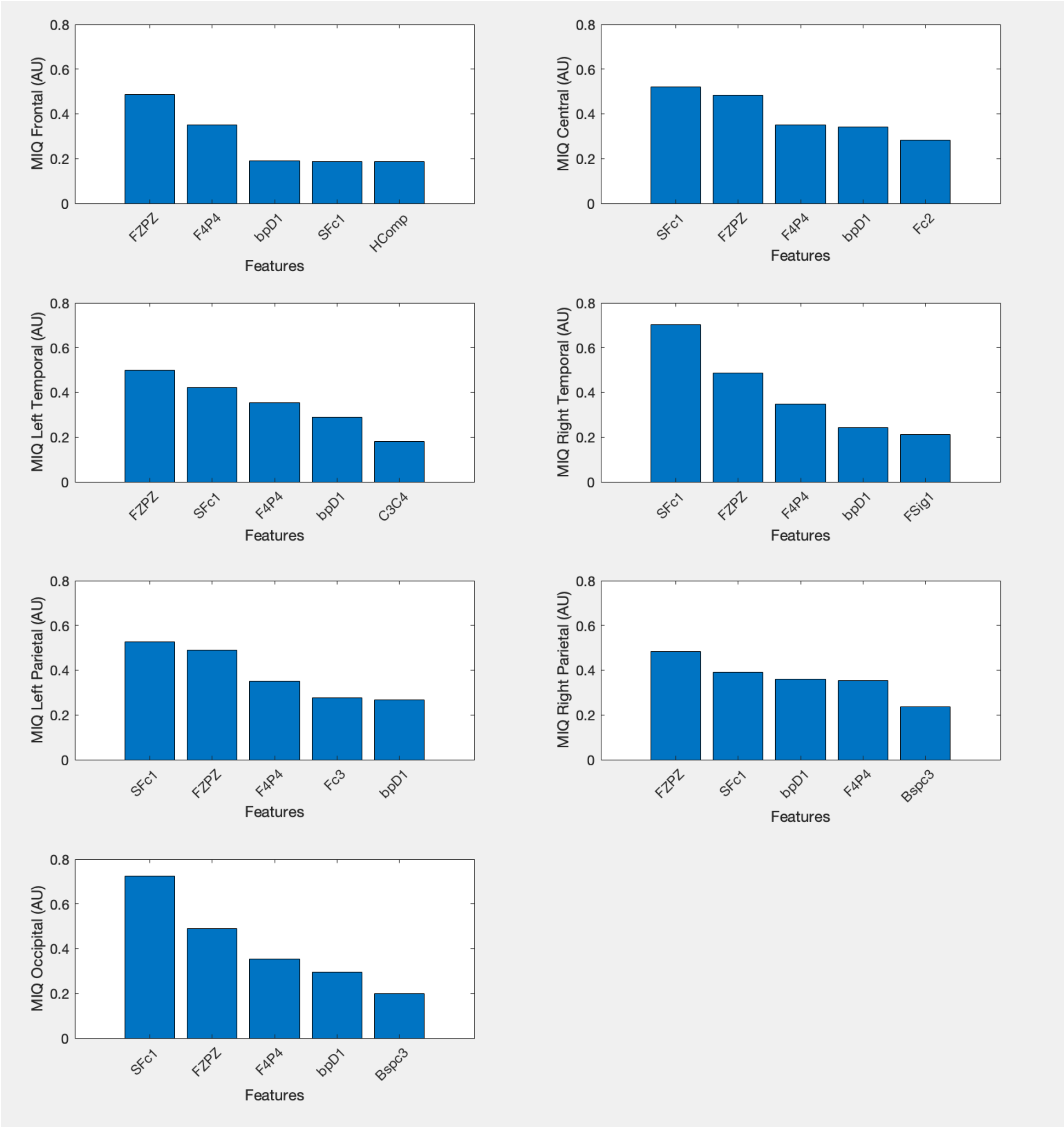

Figure 21: **Subplot of Top Five MIQ Features per Region of the Scalp for Condition Rain 2**

AU = Artificial Units
Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), Bspc = Absolute value Bispectrum Time Series, C3C4 = Coherence of central electrodes C3 C4, Fc2 = Center frequency, FSig1 = Bandwidth of Delta, FZPZ = Phase Lag Index of Central Electrodes, F4P4 = Phase Lag Index of Right Hemispheric Electrodes, HComp = Hjorth Complexity, SFc1 = Spectral Value at Center Frequency

4.1.5 Condition 5: No Sound 2

4.1.5.1 Mean of All Channels

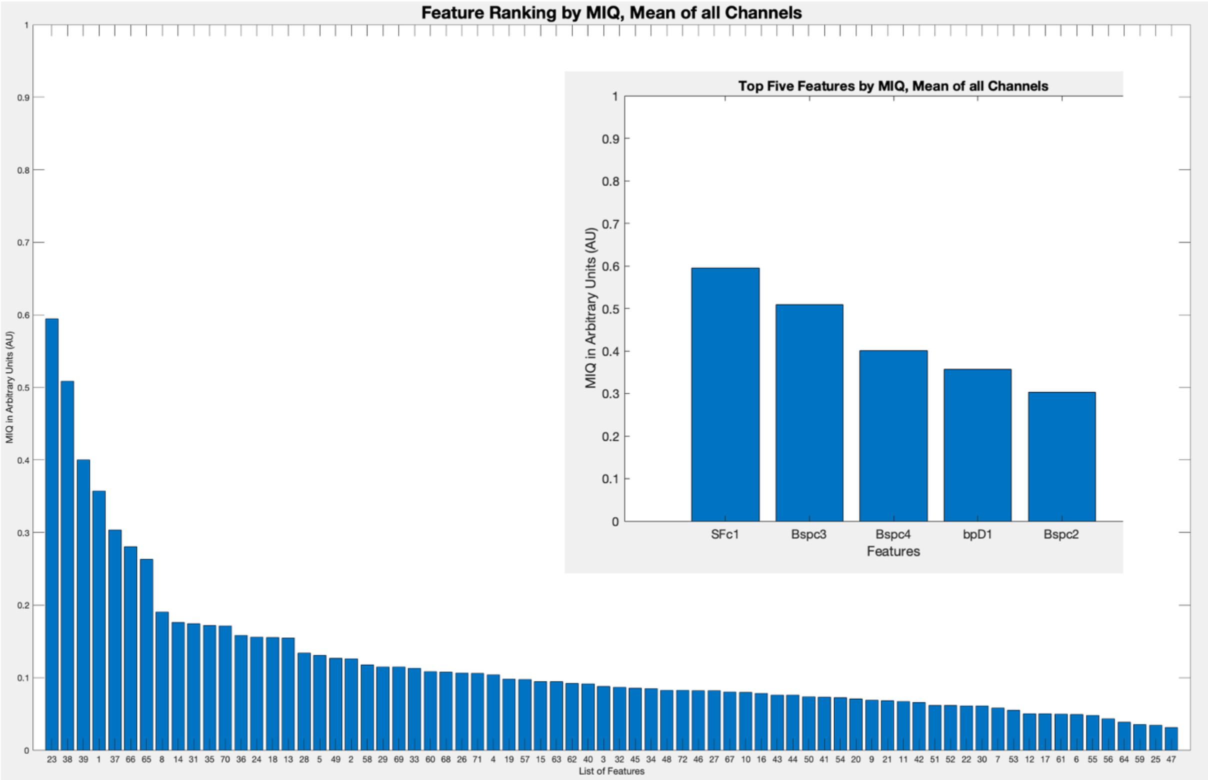

Figure 22: **Mutual Information Quotient (MIQ) of all 72 Features and top 5 Features (Inlay) in Condition 5 (No Sound 2), Mean over all 34 Channels**

All 72 features are ranked in importance by the MIQ, given the mean of all 34 channels. The inlay shows the top five most important features out of all 72 in more detail.
SFc1 = Spectral Value at Center Frequency, Bspc = Absolute value Bispectrum, bpD1 = Band Power of Delta 1 (0,5-2 Hz)

Figure 22 above shows the MIQ of all 72 features given the mean values for the fifth condition, a second condition without an auditory stimulus (No Sound 2). By visual interpretation of the MIQ graph, seven features deserve mentioning in this condition. The MIQ of these features ranges from 0,26 to 0,6 AU.

The most important feature is the spectral value of the center frequency of the delta band (SFc1) with a MIQ of approximately 0,6 AU. Accordingly, the band power of delta 1 (0,5-2 Hz) is ranked fourth, the fraction of the delta and theta band in relation to the whole spectral power is ranked seventh. The coherence between the frontal electrodes (F3 F4) is ranked sixth.

Three of the five most important features come from the bispectrum with the indices 3, 4 and 2. As such, the bispectrum of the frequencies in low gamma (3), high gamma (4) and beta (2) are among the most important features for classification.

A full table listing all 72 features as ranked by the MIQ can be found in the appendix.

4.1.5.2 Mean of Channels per Region of the Scalp

Figure 23 below visualizes the top five most important features per region of the scalp for the fifth condition without an auditory stimulus. Figure 24 shows the five most important features per region as subplots.

The bispectrum of low gamma is the most important feature in the temporal left, frontal, central and parietal right. It is mentioned as an important feature in all regions. The bispectrum of high gamma is listed in the temporal right, central, parietal left and parietal right area.

The spectral value of the center frequency of the delta band (SFc1) is the most important feature in the temporal right and parietal left area. It is the second most important feature in the frontal, temporal left and central region and also among the top five most important features in the parietal right and occipital area. In line with this, the delta band power 1 (0,5-2 Hz) is mentioned among the top five features in both temporal areas, the central area and parietal left area of the scalp.
The coherence between the frontal electrodes F3-F4 is the most important feature in the occipital region, it is the third most important feature in the temporal left and parietal right area and also ranked fourth in the parietal left area.

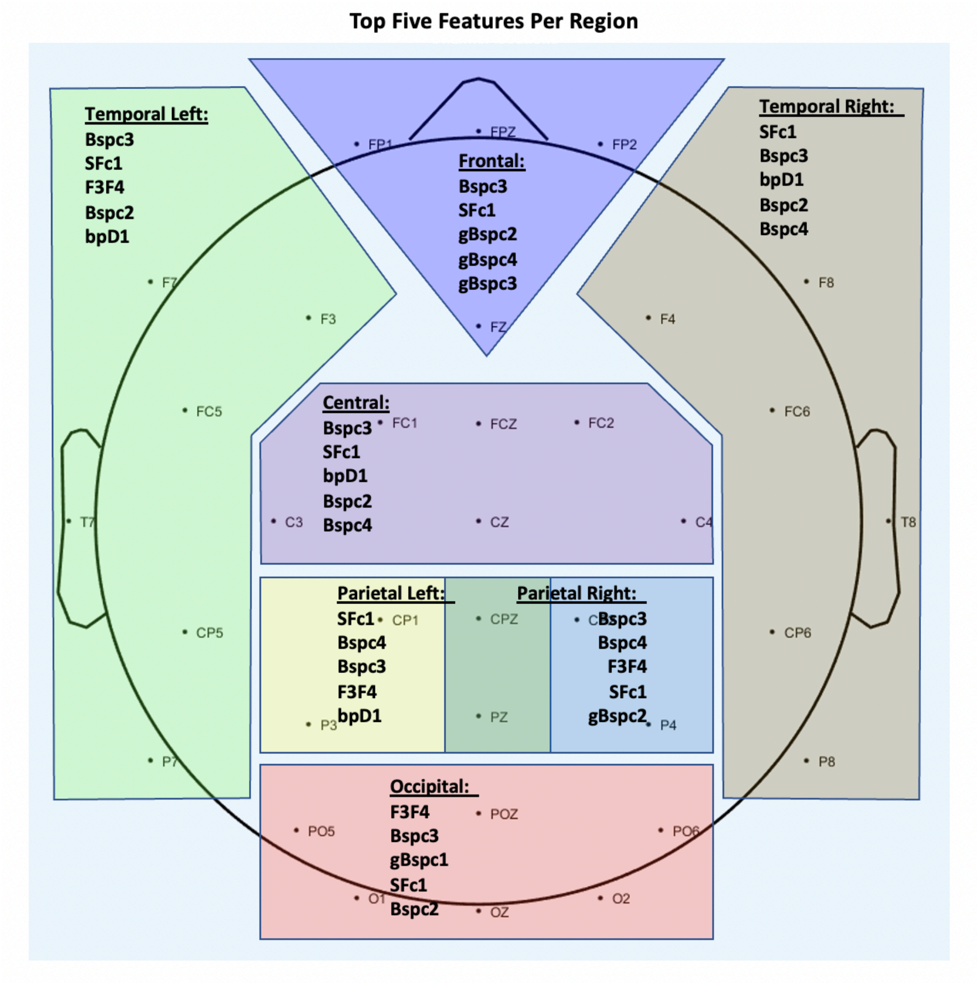

Figure 23: **Visualization of the Top Five Most Important Features per Region of the Scalp for Condition No Sound 2**

Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), Bspc = Absolute value Bispectrum Time Series, F3F4 = Coherence of Frontal Electrodes F3F4, gBspc = Phase Angle Bispectrum Time Series, SFc1 = Spectral Value at Center Frequency

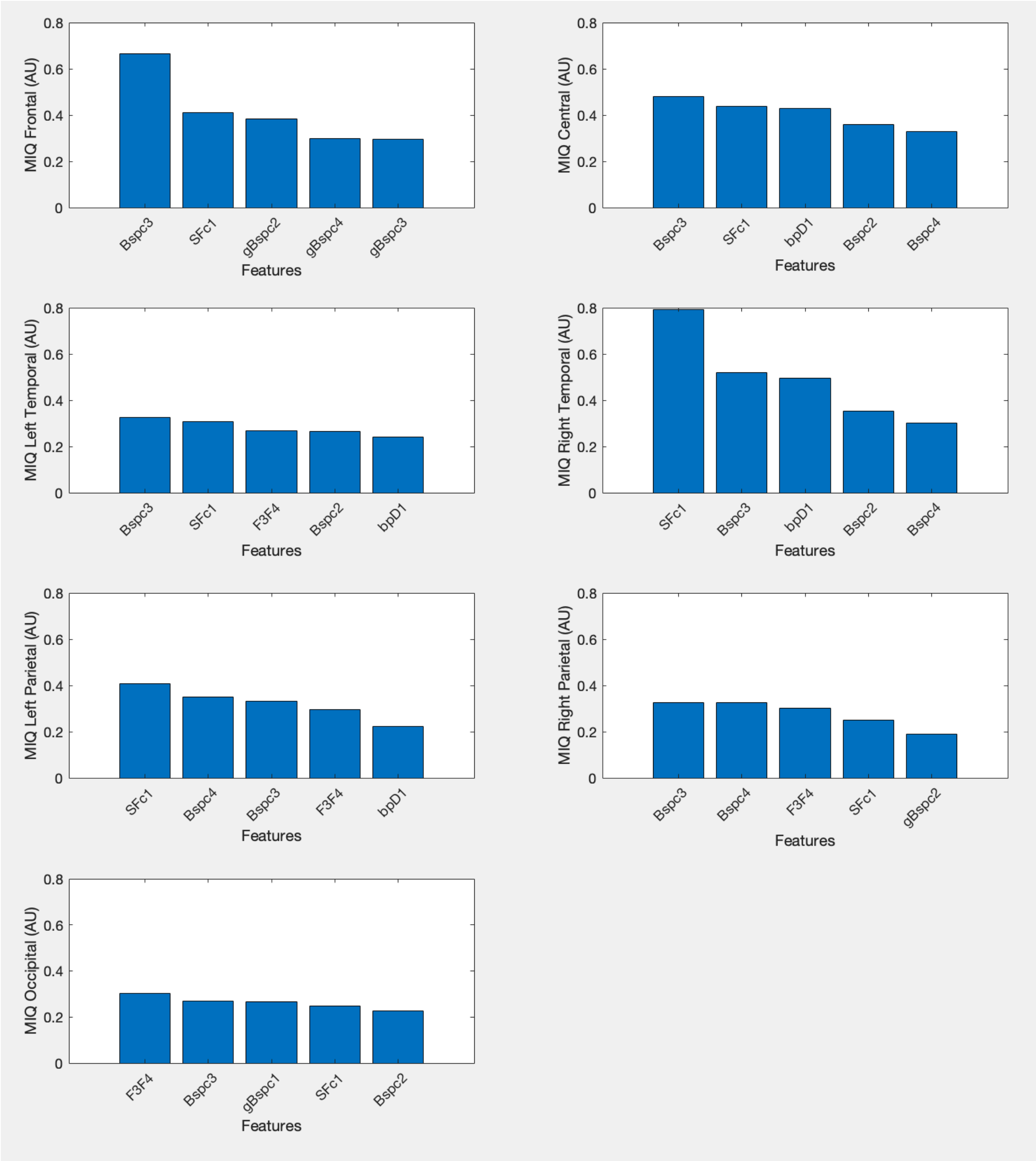

Figure 24: **Subplot of Top Five MIQ Features per Region of the Scalp for Condition No Sound 2**

AU = Artificial Units
Feature Abbreviations in alphabetical order: bpD1 = Band Power of Delta 1 (0,5-2 Hz), Bspc = Absolute value Bispectrum Time Series, F3F4 = Coherence of Frontal Electrodes F3F4, gBspc = Phase Angle Bispectrum Time Series, SFc1 = Spectral Value at Center Frequency

4.1.6 Comparison of Conditions

4.1.6.1 Comparison of the Mutual Information Quotient between the Five Conditions

As seen above, the MIQ rankings can differ substantially between different conditions. The MIQ values of the most important features per condition range from 0,2 (Spring Walk) to 0,9 AU (Rain 2). Thus, it is fair to say that in some conditions, single features take on a much more important role in the discrimination of PD patients and HC than in others. In some conditions, features might share a similar and lower MIQ. In other conditions, a few features stand out with a high MIQ and thus higher discriminative power.

The former is true for the first (No Sound 1) and the third condition (Spring Walk): In the first condition, the most important feature has an MIQ of only 0,25 AU. While six features might be selected as most important by a rather random selection by eye, the MIQ decreases smoothly and constantly to 0,018 AU in the following features. For the third condition, the most important feature has a MIQ just exceeding 0,2 AU. In this condition, an elbow in the MIQ curve is more easily to see, pointing at a set of 10 important features. This is followed by a constant decrease of MIQ down to nearly zero.
In contrast, in the second condition, the rhythmic modulation of a Rain Sound, the most important feature (PLI of central electrodes) is dominant with a MIQ of 0,6 AU. The second and third most important features are centered around 0,4 AU. A total of five features exceeds a MIQ of 0,2 AU. As such, the top five features of the second conditions are all equally or more important than the most important features in the first and third condition.

The findings are similar in the fourth condition, a non-rhythmic modulation of the rain sound: the top feature (Spectral value of the center frequency in the delta band) reaches a MIQ of 0,9 AU. This is by far the highest MIQ for a single feature among all conditions. The second and third feature exceed 0,4 AU. A total of four features exceeds a MIQ of 0,2 AU and marks the top features in this condition.
In the last condition, another recording without auditory stimulus, the most important feature (Spectral value of the center frequency in the delta band) has a MIQ of 0,6 AU. A group of seven features exceeds 0,2 AU and can be seen as the most important feature group.
In conclusion, single features are more important and stand out in the conditions 2 (rhythmic rain), 4 (non-rhythmic rain) and 5 (No Sound 2). The groups of most important features in these groups have a higher MIQ than the first most important feature in the conditions 1 (No Sound 1) and 3 (Spring Walk). The latter two groups show a higher homogeneity in the distribution of feature importance.

4.1.6.2 Comparison of the Most Important Features in all Five Conditions

Within the different conditions, different types of features are of central importance. At the same time, some features or feature groups are of importance in more than one of the conditions. After a rather comprehensive overview of each condition on the previous pages, this result section and the following analysis will focus on the main findings and analyze these in more depth. Looking at the results above, a few groups of features stand out and deserve attention.

The first group of features involves measures of synchronized activity among brain regions. The PLI is the most important feature in the first two conditions (resting state and rhythmic rain). In addition, it is the third most important feature in condition 3 and the second most important feature in condition 4. Within this group, the PLI between central electrodes (FZ PZ) is most important but also the left and right hemispheric electrodes are of importance. The coherence between interhemispheric electrodes is also listed in four of the five conditions.

The second group of features involves the power spectrum. This includes the frequency band powers and, especially, the harmonic parameters of Welch's power spectral density estimate (PSD) for a more detailed spectral analysis. The spectral value at the center frequency of the delta band is the most important feature in the fourth condition (non-rhythmical rain) and the fifth condition (silence). In both cases, the MIQ is very high with 0,9 and 0,6 AU. In addition, this feature appears in third position in condition 2 (rhythmical rain) and in fourth position in condition 3 (Spring Walk). In line with this the band power of delta is among the top features in all five conditions except Spring Walk. If pooling different spectral features such as band powers, harmonic parameters and wave indices, the frequencies of the delta band seem of central importance. This is especially the case in the conditions with rhythmic rain (3x) and No Sound 2 (3x) but also the non-rhythmic rain condition (2x). The band power of low gamma is important in the first two conditions resting state and rhythmic rain.

The third condition, Spring Walk, seems to differ from the other conditions. The MIQ is most evenly distributed and the band powers of higher frequencies seem more important. This is mirrored in the wavelet coefficient of the first coefficient level being the most important feature. The center frequency of the alpha band is the second most important feature and even higher oscillations such as both epsilon bands and even broadband act are among the top ten features. With the differences to the other conditions in mind, the PLI (especially the left hemispheric electrodes) and coherence are important features in Spring Walk as well.

Features from the bispectrum time series need to be mentioned although they seem mainly important only in the last condition without auditory stimulus. The bispectrum in both gamma and the beta frequencies are listed as the second, third and fifth most important feature.

Comparing the importance of features within the different conditions, a few key messages seem to appear. First, measures of synchronized activity seem to play a central role, the PLI of the central electrodes is the second most important single feature when comparing all conditions with an MIQ of 0,6 AU. The importance of synchronized activity is apparent in all conditions, especially in both conditions with rain sound. As the conditions with rain sounds differ only in their rhythmic modulation, the discriminative power seems to be rather independent of rhythm or complexity of sound.

Second, the delta band seems of special importance. This applies to band powers and power indices but first and foremost to the spectral value at center frequency. In line with this, the spectral value at the center frequency of the delta band is the most important single feature when comparing all conditions with a MIQ of 0,9 AU.

However, and third, the condition of Spring Walk seems to be an exception as higher oscillatory frequencies are of greater importance here. The higher complexity of the Spring Walk Sound might be a cause.

4.1.6.3 Comparison of Feature Measurements in the Different Regions of the Scalp

After finding the most important features it might be a valuable additional information, whether certain features differ in their importance according to where they are measured. This part focuses on the measurement localizations of the most important features.

For the power spectrum, no obvious pattern seems to be recognizable by eye. The spectral value at the center frequency of delta as well as delta band power seem to be evenly distributed in their appearance. As seen in the previous sections, important measurements can be found in every region. The same seems to be true for measures of synchronized activity and bispectrum time series. As such, this might be the fourth key message, important measurements of the same features have been made, irrespective of location.

4.1.6.4 The Need for High-Dimensional Classification

The first part of the results section showed the most important features to discriminate HC from PD in each condition. This gives a better understanding of the quality and relevance of single features and feature groups. However, few features, albeit the most important ones, are not sufficient for classification as shown below in figure 25: samples of both groups are mixed and appear on the extreme end of the feature axes in the three-dimensional feature space. Even the centers of both groups are very close to each other. As such, a discrimination on the basis of only three features does not seem possible. This highlights the need for more features for classification and a higher-dimensional feature space in a computer-based model. Thus: the need for a pattern recognition algorithm. The results of the respective classifications are shown in the following section.

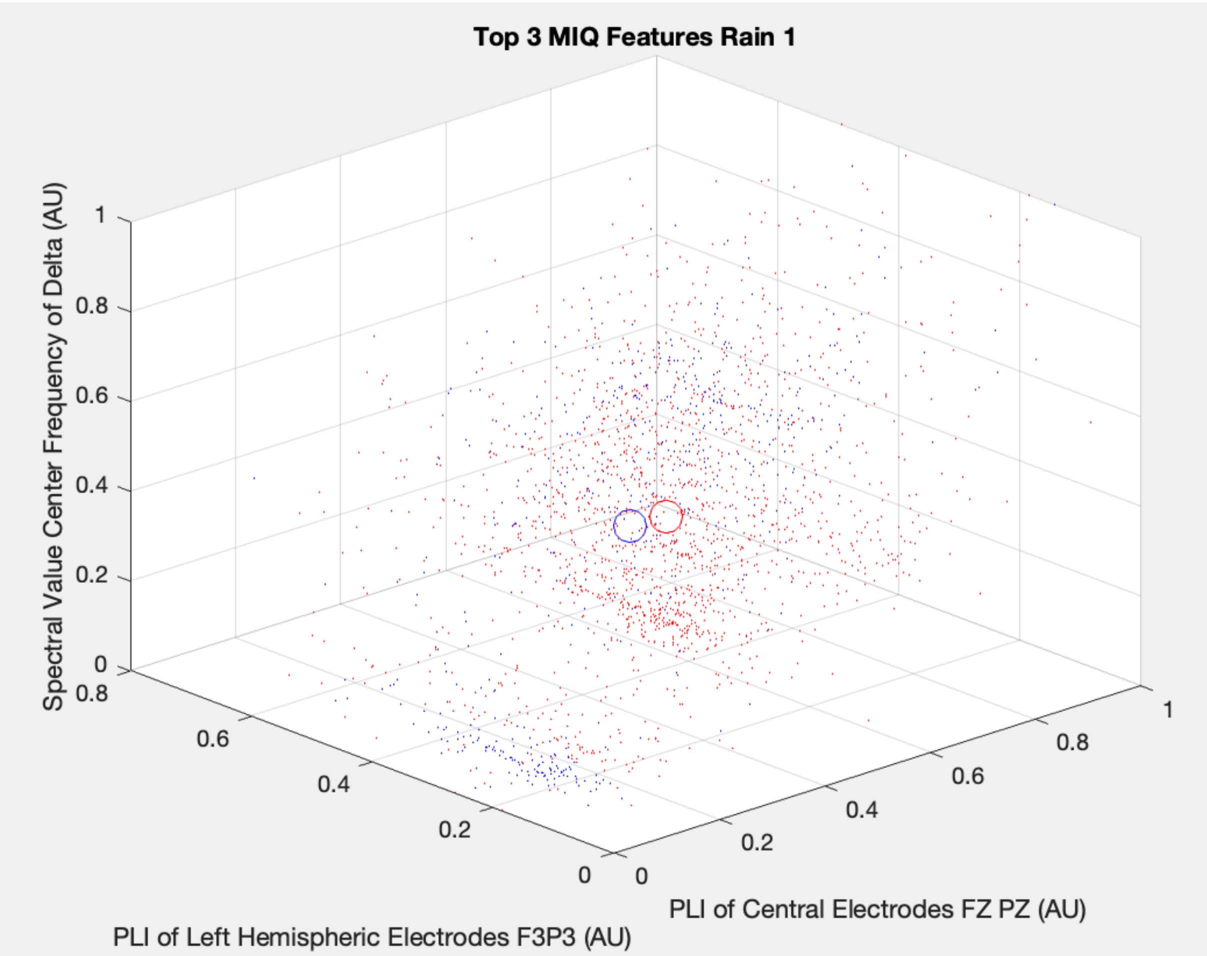

Figure 25: **Scatterplot of Healthy Controls (Blue) vs. PD Patients (Red) along the top three most important MIQ-Features in Condition 2 (Rain 1)**

AU = Arbitrary Units
Samples of both groups appear on the extreme ends of all three feature axes and the center points are grouped closely together. Thus, a classification based on only the three most important features does not seem useful. A classification in a higher-dimensional feature space is needed for accurate classification. This requires a computer-based approach.

4.2 Classification of Both Groups by a Support Vector Machine

The first part of the results focused on the most important features for discrimination of both groups. The following section will now look at the classification performance to discriminate both groups as either PD patients or HC. This is done through a discriminant function using a SVM as explained in section 3.4. Whereas the first section 4.1 used the mean of feature measurements to gain an overview of the general importance of features, the classification in the second part is based on the complete measurement of all features at all channels in a high dimensional feature space.

4.2.1 Classification with Each Condition as a Training Set

As explained in part 3.4.5 in more detail, every supervised ML algorithm requires labelled training data in order to make classifications of unknown data. In the first classification mode, the training data is taken from the same condition as the testing data. For example, if data from the first rain condition is to be classified, the SVM has been trained on samples from the first rain condition before. If one subject is tested, all remaining subjects will be used for training as explained in more detail before. This way, the tested data is always unknown to the classifier (Leave-One-Out Cross Validation).

This approach gives an overview, whether an accurate classification of both groups by a classifier is generally possible. This approach produces the following results as visualized in figure 26. Table 5 lists the exact accuracies and the number of features selected after dimensionality reduction in more detail.

Table 5: **Features Selected and Testing Accuracies for Each Condition with Training Samples from the Same Condition**

Sound Condition	Number of MIQ features selected	Classification Accuracy Total (%)	Classification Accuracy PD (%)	Classification Accuracy HC (%)
No Sound 1	104	94	93	97
Rain 1	102	94	94	94
Spring Walk	112	89	87	96
Rain 2	166	88	88	89
No Sound 2	128	90	88	95

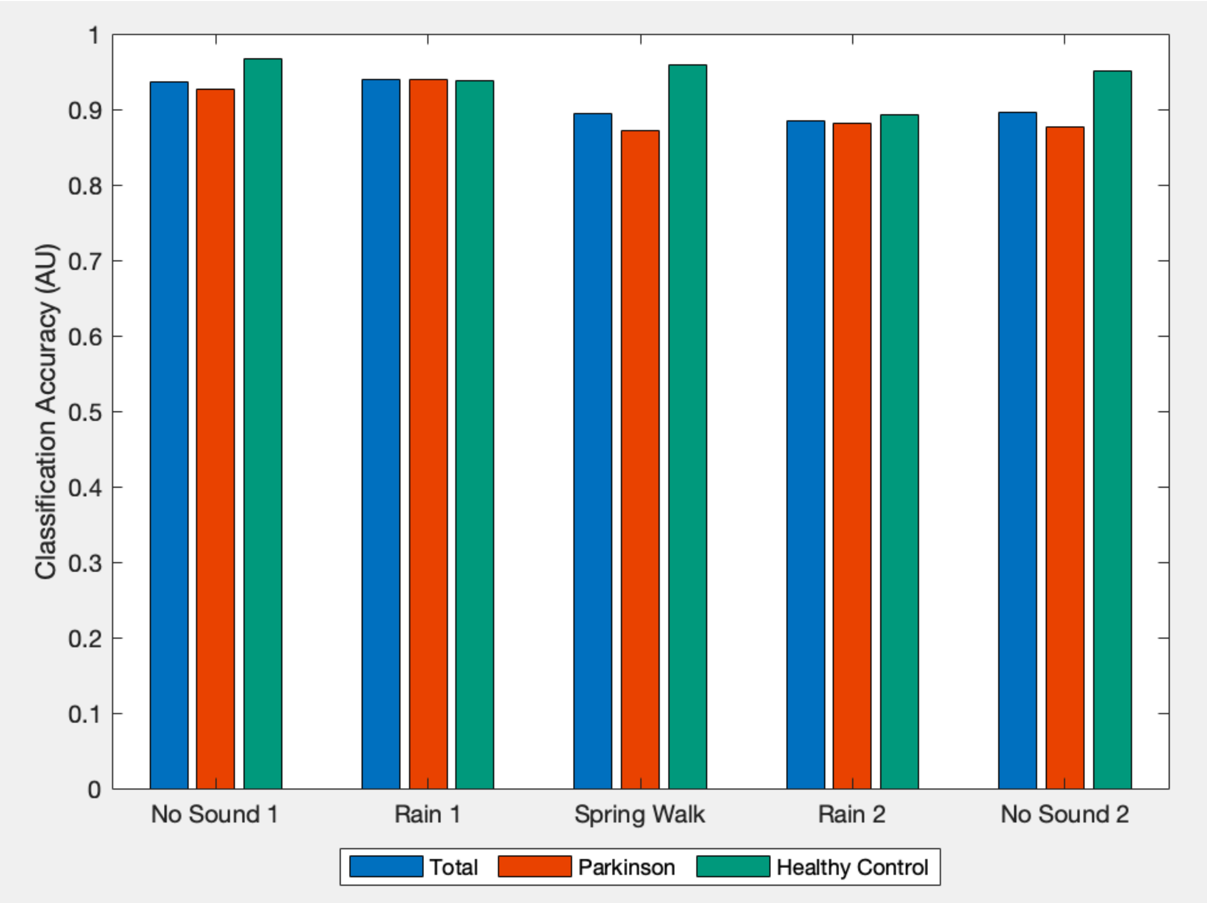

Figure 26: **Classification Accuracies for Each Condition with Training Samples from the Same Condition**

AU = Artificial Units
First Mode of Classification: The SVM has been trained for every condition separately using features selected as relevant only for every single condition. The classification accuracies are very convincing for every condition.

The results show an overall convincing classification accuracy for all five conditions. There seems to be a slight tendency towards the HC. However, the classification of both groups can be seen as accurate. As such, it is safe to say that an accurate classification of both groups is generally possible. However, as the SVM has been trained newly for each condition, the features chosen for classification might be condition-specific. In order to find a feature subset which can be used for classification of PD in general, it is necessary to use the same set of training features for testing in all conditions.

4.2.2 Classification with Resting State Condition as a Training Set

In line with the above, the training data in the following classification mode is taken from the first condition, resting state, without any auditory stimulus. The resting state might provide for a feature set which is not influenced by auditory stimuli. After training the classifier in the first condition, the data of the other conditions will only be used for testing. If classification is accurate, the training features of the first condition can be seen as generally applicable to PD.

This approach produces the following results as visualized in figure 27. Table 6 lists the exact accuracies. The number of features selected is the same in every condition as the same training set was used for all conditions.

Table 6: **Classification Accuracy and Features Selected; SVM Trained in Condition 1, Conditions 2-5 as Pure Testing Data**

Sound Condition	Number of MIQ features selected	Classification Accuracy Total (%)	Classification Accuracy PD (%)	Classification Accuracy HC (%)
No Sound 1	104	94	93	97
Rain 1	104	73	90	21
Spring Walk	104	80	88	54
Rain 2	104	76	94	22
No Sound 2	104	73	91	17

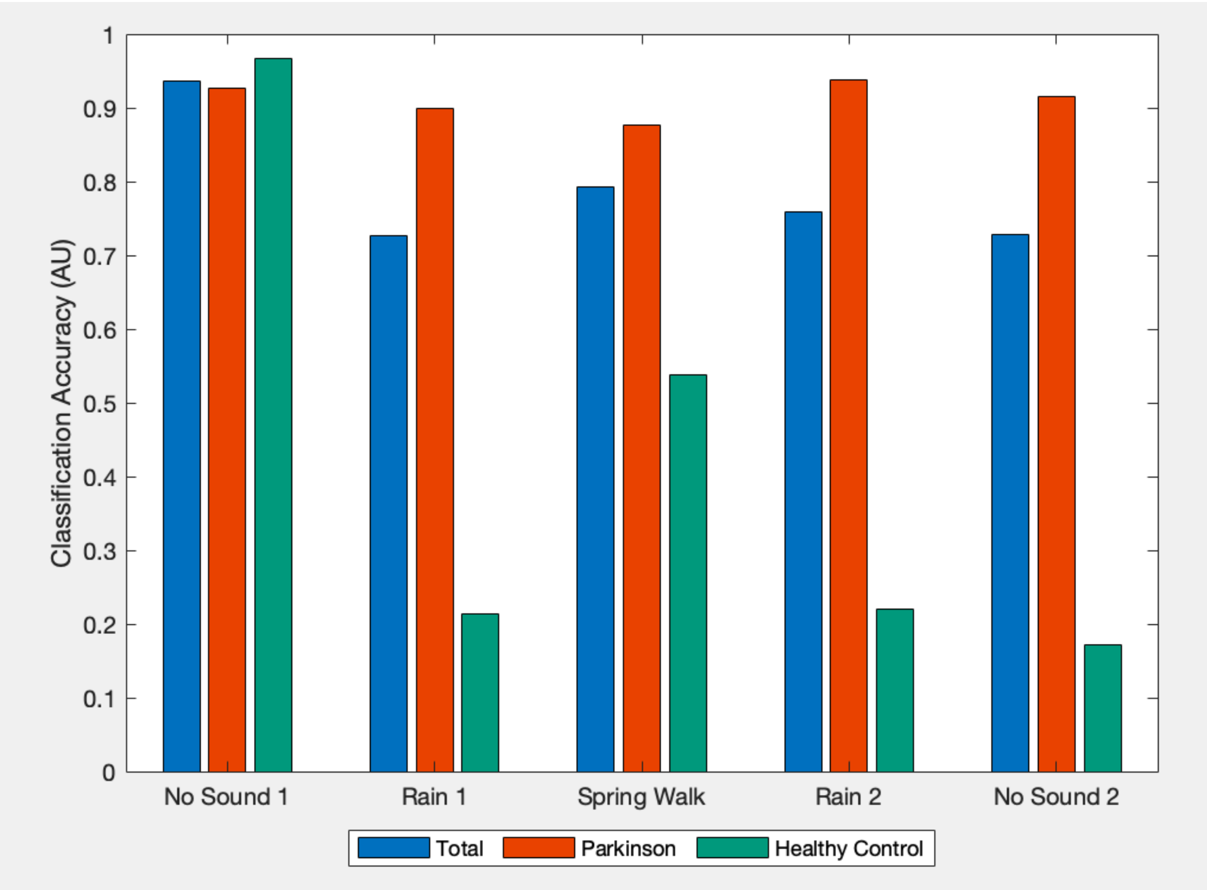

Figure 27: **Classification Accuracies for Each Condition; SVM Trained in Condition 1, Conditions 2-5 as Pure Testing Data**

AU = Artificial Units
Second Mode of Classification: The SVM has been trained only in the first condition, resting state. The data of all other conditions is used as pure testing data. The classification accuracies have dropped considerably. The HC samples are now mainly classified as PD.

Looking at the results of this section there is an obvious gap between the classification of the two groups. Patients with PD are still classified convincingly with a classification accuracy of around 90 % or higher. HC, however, are not classified correctly.

In the third condition, Spring Walk, the classification accuracy of HC is around 50 %. As such, a classification is not possible in this condition, the result equals a random classification by coincidence. Interestingly, HC are classified at an accuracy of only 20 % in the rain conditions and the last condition without sound. This means, in turn, that 80 % of the HC samples have been incorrectly classified as typically PD in these three conditions. In other words, samples of HC show typical characteristics of the PD group under influence of these stimuli.

4.2.3 Classification with Resting State Features and Separate Training for Each Condition

The features of the resting state condition seem to be generalizable for PD samples also in the other conditions. As accuracy has decreased significantly for HC with pure testing without training, this section will examine whether classification is more successful with separate training for each condition. The features will still be those as selected in the first condition, resting state.

The results are visualized in figure 28. Table 7 lists the exact accuracies. The number of features selected is still the same in every condition as the same training set was used for all conditions again.

Table 7: **Classification Accuracy and Features Selected; SVM Trained in all Conditions, Features from Resting State**

Sound Condition	Number of MIQ features selected	Classification Accuracy Total (%)	Classification Accuracy PD (%)	Classification Accuracy HC (%)
No Sound 1	104	94	93	97
Rain 1	104	85	83	90
Spring Walk	104	87	85	92
Rain 2	104	81	80	86
No Sound 2	104	84	83	88

The results show a convincing classification accuracy for both groups in all conditions again. There is a slight tendency towards HC again but both groups are classified very well. The features as selected in the first condition are still suitable for classification. For a sufficient classification, however, separate training is needed in every condition.

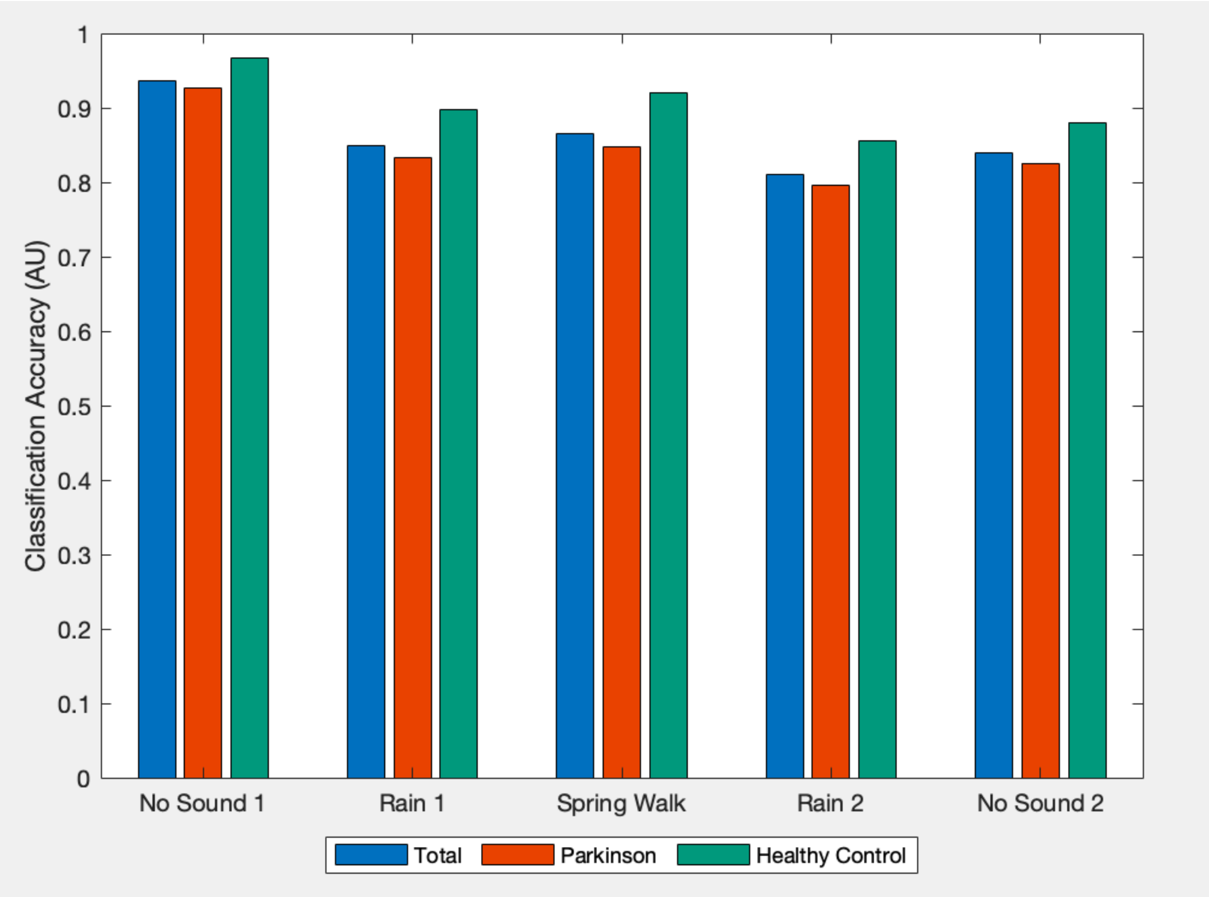

Figure 28: **Classification Accuracies for each Condition; Feature Selection from NS1, Separate Training for all Conditions**

AU = Artificial Units
Third Mode of Classification: The SVM has been trained for every condition separately using the feature selection from the first condition, resting state. The classification accuracies are convincingly high again. The HC samples seem to have drifted towards the PD samples along a common set of feature axes. A separation of both groups is still possible.

5 Discussion

5.1 Summary of Results and Interpretation

5.1.1 The Classification of Patients and Healthy Controls is possible

This study was carried out in the context of a large-scale biofeedback project at the UBC in Vancouver, Canada. In line with this, the first research question was whether it is generally possible to distinguish EEG recordings of PD patients from EEG recordings of HC by a pattern recognition algorithm.

Looking at the results in 4.2.1 it is safe to say that a correct classification of both groups is generally possible and it is even possible with very good accuracies of more than 90 %. This applies to both groups, PD and HC, with only a minimal inclination towards better classification of HC. Also, classification is comparably accurate in all five conditions. In order to see, whether classification was generally possible, the algorithm had been trained for each condition separately in this first classification model. In consequence, from a technical point of view, the hyperplane as the separating element in the high dimensional feature space was different for each condition. This showed convincing classification results but provided only for a limited interpretability regarding the effect of the stimuli or generalization of the most important features.

5.1.2 The Auditory Stimuli mainly affect the Healthy Controls

As indicated above, classification based on separate training in each condition suffered from limited comparability between conditions. Therefore, the next classification model used a SVM trained in the first condition only and used the data of the other four conditions as testing data only. This provided for direct comparability as all testing data was now classified along the same hyperplane based on the same feature axes. Along the same hyperplane it was now possible to answer the second research question and to expose the effects of auditory stimuli on the qEEG and thus on classification.

The SVM as trained in the resting state condition was still able to correctly classify the EEG of patients with PD. This was not true, however, for HC. For the Spring Walk condition, classification accuracy of HC dropped to 50 %. A classification accuracy of 50 % can also be seen as a random allocation of samples or classification by pure chance. As such, classification of HC EEG samples was simply not possible in the Spring Walk condition.

Even more interesting, in the rain conditions and the last condition (No Sound 2), the classification accuracy for HC even dropped to as low as 20 %. As such, classification was not random and thus not pointless in these cases. Instead, with only 20 % of correct HC classification, 80 % of the HC EEG samples were incorrectly classified as PD. Imagining the high dimensional feature space, the large majority of

HC samples seemed to have moved towards the correctly classified PD samples. While moving, the HC samples even seemed to have switched sides along the separating hyperplane and were therefore misclassified as PD in high numbers.

If HC samples seem to move towards PD samples within the high dimensional feature, the questions arise, how close exactly the HC samples move towards the PD samples. More precisely, whether an accurate classification under the influence of the stimulus is still possible and whether this is possible using the same features.

In order to test, whether classification is still possible along the same feature axes, a third classification model had been used: The classifier was trained separately for each condition again. The features used for training, however, were those used to train the SVM in the first condition and thus stayed the same. By doing so, a *new separating hyperplane* was created for each condition but along *the same* feature axes. As seen above, the classification worked very well again albeit with a slightly lower accuracy. It is thus fair to say that it is still possible to accurately classify both groups under the influence of the auditory stimuli.

This makes it possible to sufficiently answer the second research question concerning the effect of auditory stimuli in this study. The two rain conditions and the last condition without any auditory stimulus make the classification more complicated as the HC samples move closer towards the PD samples. A classification, however, is still possible by creating a new hyperplane along the same feature axes. As such, the HC samples move closer to the PD samples but remain distinguishable. In other words, the EEG of HC seem to take on characteristics formerly seen as specific to the EEG of patients with PD. The above does not fully apply to the third condition, Spring Walk, where the drift from HC samples towards PD samples was not as distinct as in the other three conditions.

5.1.3 Frequencies of the Delta Band and the Phase Lag Index as the most important Features

As seen in 4.1, a substantial number of features needs to be taken into account for appropriate classifications. After giving a rather comprehensive overview, the most important features and feature groups will now be illuminated as the main findings in more depth.

Accordingly, the third research question was directed at the features most relevant for classification. This is especially interesting in light of the classification results and the movement of HC towards PD in three of the five conditions. In other words: if samples of HC drift towards PD, which features is this based on? As PD cannot be the reason for movement there must have been a confounder. This confounder would need to characterize both PD samples and HC samples under the influence of the auditory stimulus.

The most important feature group is related to the delta frequency band (0,5-4 Hz). Important features in this study are the band power of delta, indices of the delta band power in relation to other band powers and harmonic parameters such as the center frequency of the power band or the spectral value at the center frequency. Generally, this matches existing literature as outlined in 2.5. Many studies before have shown a general slowing as well as an increased importance of delta power in PD, sometimes potentially indicating mild cognitive impairment (MCI) (Neufeld et al., 1988; Soikkeli et al., 1991; Han et al., 2013). It is therefore possible to say that this study confirms existing literature on the role of delta power in PD. In addition, it further advances these findings by extending it to the importance of harmonic parameters of delta.

The importance of delta seems logical in the light of the classification results: as samples of HC have come closer to samples of PD in the feature space, there seems to have been a slowing in the EEG of HC due to the stimuli. The rain conditions have been described as very relaxing by many of the participants. The slowing in the HC EEG and the increase of the importance of delta might therefore have been caused by the relaxing effect of the rain sounds and the silence in the last condition. This also matches findings in existing literature: Tang et al. were able to show that relaxation induced by audiovisual stimulation led to increased delta activity in patients with insomnia (Tang et al., 2019). Going one step further, it might even be possible that the sounds induced early stages of sleep in some of the subjects. This might be reasonable as delta waves are generally associated with sleep (Purves et al., 2001; Simões et al., 2010). Summing up, a possible reason for the movement of HC samples towards PD samples, thus the confounder, might have been the relaxing effect of the sounds, even up to a sleep-inducing effect. The previously described shift towards lower frequency bands (mainly delta) in HC could not be observed in PD patients. This was most likely due to the already prevalent slowing of the EEG in PD.

Another important feature was the PLI as an indicator of functional connectivity. Very recent studies have confirmed that the PLI might be a general indicator for MCI (Kuang *et al.*, 2022). Chaturvedi et. al emphasize the PLI as an early indicator for cognitive decline in PD and as more effective to classify both groups than features of spectral power (Chaturvedi *et al.*, 2019). The great impact of the PLI in classification is confirmed in this study as well. Looking at the HC, the interesting question might be how the PLI in HC controls is affected by the auditory stimuli. Given that the PLI tends to be lower in PD, there might have been a lowering of the PLI due to the stimuli as well. The literature is not completely clear in this case. Imperatori et al. describe the PLI as a good indicator to classify different sleep stages and states of attention (Imperatori *et al.*, 2021). Liao et al also found sleep characteristics of the PLI but described *increased* functional connectivity in certain sleep stages (Liao et al., 2019). As such, the exact relationship between measures of functional connectivity and sleep deserves more attention. This study certainly suggests that first, the PLI is an important feature for classification and second, the value of PLI is negatively affected by relaxing auditory stimuli.

In condition Spring Walk, the wavelet analysis at decomposition level 1 was the most important feature reflecting a frequency range from 126 to 250 Hz. This is in line with higher frequencies being generally more important in this specific condition, including the band power of the broadband act.

In the last condition, the second condition without auditory stimulus, bispectrum analysis of the gamma and beta bands were relevant features. This indicates the relevance of non-linear characteristics in this condition.

5.1.4 Complexity as an Important Characteristic of Auditory Stimuli

In this study, we have seen a drift of HC samples towards samples of patients with PD as the main finding in three of four conditions (the first condition without auditory stimulus as resting state being the reference classification). What is the difference between them? In line with this, an attempt can be made at this point to answer the fourth research question, which characteristics make a stimulus effective.

Originally, one of the main ideas behind this study was to see which features of sounds or music render music therapy as effective as it is in clinical practice. Therefore, a drift of PD samples towards HC samples could have been a desirable result to show how PD samples take up healthier characteristics through auditory stimulation. However, the opposite was the case. As such, it needs to be said that none of the chosen sounds seemed to be effective in the formerly desired way. Supposing that this was due to increasing relaxation of even sleep induction by the stimuli, it is still interesting to see how this happened to a different extent in different conditions and why.

The drift of HC towards PD was prominent in both conditions with rain sound. The two rain conditions differed in the pace of volume modulation as outlined in 3.3: the first rain condition with a cycle duration of only three seconds was intended to give a rather rhythmical feel and make the sound less relaxing. The second rain condition did not have that rhythmical impact. In terms of classification results the different modulation results barely showed a difference. As such, no difference between both stimuli could be detected. Hence, the rhythmical component did not show any effect in this study. It is important to mention, however, that this result might also be due to an insufficient rhythmical feel of the modulation, maybe the modulation duration (chosen to fit the epoch length) has simply been too slow. Possibly, the result might have been different with a faster or steeper modulation. It is thus important to say that the rhythmical component of *this study* proved ineffective, rhythm as such is still seen as an important feature of effective music therapy in literature (Thaut, 2005).

The drift of HC towards PD was the most prominent in the last condition (no auditory stimulus) with a correct accuracy of HC as low as only 17 %. In line with the above, a possible interpretation could be an even more increased relaxation (or even sleepiness) in the absence of any stimulus after a period of relaxing sounds.

On the contrary, the drift was not so obvious in the Spring Walk condition with an accuracy of 54 %. Hence, the classification accuracy was bad but the classification was undecided. Technically, the HC samples had moved towards positions directly along both sides of the hyperplane in equal shares. So, the effect of the Spring Walk sound still was not the originally desired one but less relaxing or sleep-inducing as the rain sound. This might have been due to the higher complexity of the stimulus. While the rain sound was one-dimensional the Spring Walk sound consisted of ten different sub-sounds such as birds, bees and water sounds. This complexity might have been the difference. This idea is backed by the results as indicated in 4.1.3.1: unlike in other conditions, subbands with higher frequencies such as alpha (8-12 Hz), high gamma (61-90 Hz), epsilon (91-150 Hz) and even frequencies of the broadband act (151-249 Hz) were important in this classification. In line with this, the higher complexity might have stimulated higher centers of neural processing and thus did not lead to an increase of Delta importance in this condition. In addition, technically speaking, the importance of other frequency features also shows a drift along other feature axes as trained in the SVM. As such, the nearly coincidental classification of HC samples (54 %) was not only caused by less drift towards the existing hyperplane. It was additionally also caused by a misfit of the existing hyperplane due to completely different feature axes in this condition.

5.2 Clinical Relevance and Implications of Machine Learning and Big Data in Medicine

The application of auditory stimuli did not have the desired effect in this study. The method, however, did work quite satisfyingly and its potential in diagnosis deserves emphasis. With help of artificial intelligence and ML it is possible to distinguish EEG data which is barely distinguishable for humans in another way.

Even when using the same set of features in all conditions the SVM achieved an overall classification accuracy of 80 % and more. The misclassification when using data from other conditions only for testing has most likely been caused by the influence of the auditory stimuli and the following drift of samples. Hence, it is possible to say that there are certain EEG features which can be *generally* used for classification of PD and that a SVM can be seen as an appropriate tool for classification. In line with this, the role of the EEG in combination with ML might gain in importance for early detection and diagnosis of PD.

On top of this, the potential of ML is of course neither limited to the EEG, nor to neurology in general. This study can rather be seen as a general example for the organizational and classifying power of ML algorithms in the presence of large amounts of disorganized data.

5.3 Limitations and Outlook

This study shows the immense potential of ML in the analysis of large amounts of data and that a classification of HC and PD is possible based on the EEG. For a preferably complete picture, however, certain aspects need to be put in perspective.

The role of frequencies of the delta band has been shown as crucial for the outcome of this study. When assigning such an importance to a group of features it is necessary to look at it from a critical point of view as well: the epoch length was set to three seconds in this study. Within three seconds, an oscillation of the slowest delta frequency (0,5 Hz) can maximally occur 1,5 times if measured exactly. As such, some delta oscillations might not have been captured correctly. As a result, the impact of the delta frequency might not be as big as seen in this case. In future studies it might be interesting to compare the results if longer epoch lengths are chosen.

Similarly, another main hypothesis of this study was that the sample drift was likely due to relaxation and thus a general slowing of the EEG. It is not sure, however, to which extent such a slowing is PD specific. Furthermore, it needs to be stated that the prevalence or the extent of cognitive decline has not been closely assessed in this study. A slowing of the EEG, likely based on cognitive decline, is also seen in other neurodegenerative disorders such as Alzheimer's disease (Baker *et al.*, 2008). It might thus be interesting for future research to include a patient population with cognitive slowing not caused by Parkinson's to see whether the sample drift is specific to PD. Thereby, it would also be possible to assess whether the slowing and the increase of delta power can be used as a biomarker and in neurofeedback therapy.

Moreover, the hypothesis of relaxation or even sleep as the reason for the sample drift could be further examined by qualitative analysis of the EEG. For example, sleep spindles or other relaxation patterns might support the relaxation hypothesis in visual analysis of the EEG. On the contrary, sleep spindles are usually seen in frequencies of 12-14 Hz (de Gennaro and Ferrara, 2003).

Complexity has been seen as relevant for a sound to show an effect, because the complex Spring Walk sound was not as extensively subject to the sample drift. However, only two different sounds have been used in this study. It might be interesting to analyze the effect of more complex stimuli or even music. For this study, music had been excluded as a stimulus for being too complex. With these findings and the EEG classification in mind it might be interesting to analyze for the effect of music, even different kinds thereof.

Looking at the study design, the HC collective has been smaller than the PD collective (4 HC vs. 12 PD). The recruitment of HC was more difficult than the recruitment of PD, most likely due to the remoteness of the place of study, the UBC, from the places of residence. For most of the participants, the drive took one hour in each direction. For patients with appointments in the clinic it was possible to connect these to the study. Participation in the study, in turn, took roughly 90 minutes including all assessments and setup of the EEG. As the HC were mainly recruited from the partners of the patients, most HC declined to participate in the study due to the total time effort. The imbalance of sample data was well manageable using synthesized HC samples. These were based on measured HC samples and did not show an imbalance in the results. For future studies, however, a balanced collective of participants would be desirable.

For the optimal classification performance of a SVM, a sample size of at least N-1 is required (with N = number of features). In this study, this was only the case in the sound conditions. For the conditions with no auditory stimulus, the sample size was slightly too small. As such, for the first condition, the training matrix contained 2214 samples per 2448 features; the last condition contained 2143 samples for 2448 features. While the difference between sample size and number of features is not enormous, more data samples might be beneficial in future works. When looking at the sample size, the size of the feature space deserves attention as well. For the overview to be as comprehensive as possible, many features have been chosen which caused a huge feature space. Many of the chosen features, in turn, were similar to each other, especially in the time-frequency domain. This might have led to a certain vagueness of the results. Choosing a smaller feature space in the future might thus have two beneficial effects: the sample size does not have to be as big for optimal classification results and the results might be more precise.

For comparability, all measurements were made by the same researcher in the same room, with the same equipment during similar times of the day. The qEEG is usually seen as an objective and reliable method of measurement due to its high temporal resolution and the direct measurement of neural activity (Tu *et al.*, 2015). However, Shen and Lin have shown that there can be major intrasubjective differences and significant non-stationarities of the EEG and the emotional response to music (Shen and Lin, 2019). As such, it might make sense in further research to also focus on test-retest reliability by repeating measurements of the same subjects.

Due to the scope of this study, the impact of auditory stimuli on motor functions has not been tested. Accordingly, the UPDRS has only been used to provide for homogenous patient population. However, given the impact of music therapy on motor symptoms as seen in existing literature, a possible impact of such stimuli on motor function might be an interesting subject for further research.

Another possible extension of this study might be the measurement of dopamine or dopamine-related pathways with respect to auditory stimuli given the crucial impact of dopamine in the pathophysiology of PD. Obviously, the measurement of biomarkers in body fluids always renders research more complex and resource-consuming, often due to the invasiveness of collection. Also in this case, however, machine learning might be a valid alternative in the future providing for non-invasive measurements. Recently, new pattern recognition algorithms are able to measure plasma levels of certain molecules non-invasively, for example by analysis of the electrocardiogram (ECG). This seems already possible for plasma levels of glucose (Porumb *et al.*, 2020). It might also show the need for and the benefits of using machine learning in future research, the potential seems huge.

6 Summary

6.1 English Summary

Parkinson’s Disease (PD) is the second most common neurodegenerative disorder worldwide with increasing incidence and prevalence. It mainly affects the motor system due to a loss of dopaminergic neurons in the substantia nigra and leads to cardinal symptoms including brady-/akinesia, tremor, muscle stiffness and postural instability. After clinical diagnosis, treatment is primarily based on L-dopa, dopamine agonists and MAO-B inhibitors. Even with therapy, PD continues to progress and remains uncurable. In recent years, music therapy has been established as a complementary therapy due to a variety of positive effects, mainly on the motor system. However, it is still insufficiently explained what exactly renders music therapy so effective. Possible explanations range from an increased dopamine release to a better functional connectivity of different brain areas.

The aim of this methodologically innovative study was to find underlying mechanisms for the effectiveness of music therapy based on EEG analysis. The analysis of the EEG was chosen due to its good temporal resolution, fast availability and relatively low costs. The research questions were *first*, whether it is generally possible to distinguish patients with PD from Healthy Controls (HC) based on their EEG. *Second*, whether auditory stimuli show an effect on the EEG. *Third*, which features precisely a differentiation of both groups in the EEG is based on. And *fourth*, which characteristics render an auditory stimulus effective.

The study was conducted in collaboration between the University of British Columbia (UBC) in Vancouver and the Philipps-Universität Marburg. In 2017 and 2018, 12 patients with PD and 4 age-matched HC were tested at the UBC campus. A total of 5 EEGs (conditions) were recorded from each subject at rest and under auditory stimulation. The three stimuli differed in complexity (Rain vs Spring Walk) and modulation (rhythmic and non-rhythmic). For a more precise interpretation of the results, natural sounds were used as stimuli instead of music. Due to the amount of data, a custom-made pattern recognition algorithm (Support Vector Machine) was used, distinguishing both groups through a hyperplane within a high-dimensional feature space. Redundant data was removed in advance by calculating the mutual information quotient to include only relevant data in the final analysis.

It could be shown that, *first,* the differentiation of both groups on the basis of the EEG is generally possible, in this case even with a convincing classification accuracy of up to 90 %. *Second,* the auditory stimuli mainly had an effect on the EEG samples of HC and made the classification more complex: the EEG samples of the HC approached those of the PD patients within the feature space, rendering a common hyperplane for all conditions ineffective. Based on shared features but with a separate hyperplane in each condition classification accuracy of 80-90 % and thus very good discrimination of both groups could be achieved again even under the influence of auditory stimuli.

Third, the by far most important features to distinguish both groups were related to the delta frequency band (0.5-4 Hz) including band power, indices of the delta band, and harmonic parameters. The increased importance of delta in PD matches existing literature, most likely due to cognitive decline. This study enhances existing literature on delta by the harmonic parameters, mainly the center frequency and the spectral value thereof. In addition, the delta frequency band is often linked to relaxation and sleep. Thus, the convergence of the EEG samples is most likely explained by stimulus-induced relaxation. Another important feature seems to be the phase lag index. It is also mentioned in the literature as an indicator of mild cognitive impairment and decreases under the influence of the stimuli. A link between the PLI and functional connectivity, as mentioned in the literature, cannot be shown in this study.

Fourth, the convergence of the HC samples towards the PD samples was particularly evident in the rain conditions with misclassifications of up to 80 %. This was the case in both the rhythmic and non-rhythmic variants. Given the importance of rhythm as often shown in literature on music therapy it appears that the intended modulation was not perceived as rhythmic by the subjects. The convergence of samples was less evident in the spring walk condition, where higher frequency bands were relevant too. Auditory stimuli thus seem to need a basic complexity to show an effect on the EEG.

Approaches to further research arise. For example, if the delta band is expected to be important, greater epoch lengths than in this study (3 seconds) could be analyzed to avoid false interpretations due to epochs being too short to capture very slow oscillations. In addition, a general slowing of the EEG is probably not specific for PD. For a more specific analysis, the inclusion of participants with mild cognitive impairment (PD-MCI as well as MCI not caused by PD) would be useful. Testing more complex stimuli such as music, an inclusion of motor functions in the analysis or even a measurement of dopamine levels would also remain of interest. Looking at the study design, a more balanced patient population might be beneficial.

In order to show an effect of music therapy in the EEG, a convergence of PD samples towards HC samples would have been desirable. Due to the relaxation, the opposite was the case. The chosen methodology, however, seems very appropriate. The classification of both groups was possible on a convincingly high level and recommends this approach for further research, due to its variability beyond neurology and even medicine.

6.2 Deutsche Zusammenfassung

Das idiopathische Parkinson-Syndrom ist die zweithäufigste neurodegenerative Erkrankung der Welt mit weiterhin steigender Inzidenz und Prävalenz. Über den Untergang dopaminerger Neurone in der Substantia nigra betrifft es vor allem das motorische System und führt zu den Kardinalsymptomen Brady-/Akinesie, Tremor, Rigor und posturaler Instabilität. Nach klinischer Diagnose wird vorrangig medikamentös mit L-Dopa, Dopaminagonisten und MAO-B Hemmern therapiert. Auch unter Therapie bleibt das idiopathische Parkinson-Syndrom weiter progredient und ist nicht heilbar. Als komplementäre Therapie hat sich in den letzten Jahren aufgrund einer Vielzahl positiver Effekte die Musiktherapie etabliert. Trotzdem ist der genaue Wirkmechanismus der Musiktherapie noch nicht sicher bekannt. Mögliche Erklärungsversuche reichen von einer gesteigerten Dopamin-Ausschüttung bis hin zu einer besseren funktionalen Konnektivität verschiedener Hirnareale.

Ziel dieser Arbeit war es, Gründe für die Wirksamkeit von Musiktherapie im EEG zu finden. Für die Analyse des EEG sprachen mit Blick auf die auditiven Stimuli vor allem die gute zeitliche Auflösung sowie die schnelle Verfügbarkeit und die verhältnismäßig geringen Kosten. Die genaue Fragestellung hierbei war viergeteilt: *Erstens,* ob eine Unterscheidung von Parkinson-Patienten und gesunden Probanden im EEG zunächst generell möglich ist. *Zweitens,* ob auditive Stimuli einen Effekt auf das EEG zeigen. *Drittens,* anhand genau welcher Kennzeichen eine Unterscheidung beider Gruppen im EEG möglich ist. Und *viertens,* welche Charakteristika ein auditiver Stimulus haben sollte, um einen Effekt im EEG zu zeigen. Die Studie wurde in Zusammenarbeit der University of British Columbia (UBC) in Vancouver und der Philipps-Universität Marburg durchgeführt. 2017 und 2018 wurden hierzu auf dem Campus der UBC 12 Parkinson-Patienten und 4 Kontrollpersonen gleichen Alters untersucht. Von jedem Probanden wurden insgesamt 5 EEGs (Konditionen) in Ruhe und unter auditiver Stimulation aufgenommen. Die insgesamt drei verschiedenen Stimuli unterschieden sich dabei in ihrer Komplexität (Regen und Frühlingsspaziergang) und ihrer Modulation (rhythmisch und nicht-rhythmisch). Im Sinne einer präziseren Interpretation der Ergebnisse wurde bei der Stimulation zunächst auf Musik verzichtet und stattdessen Naturgeräusche benutzt.

Aufgrund der anfallenden Datenmenge kam ein Mustererkennungsalgorithmus (Support Vector Machine) zum Einsatz, welcher beide Gruppen mittels Trennebene innerhalb des Koordinatenraumes unterscheidet. Redundante Daten wurden im Vorfeld durch die Berechnung des Mutual Information Quotienten entfernt, so dass in die endgültige Analyse nur relevante Informationen einflossen.

Es zeigte sich *erstens*, dass die Unterscheidung beider Gruppen anhand des EEGs generell sehr gut möglich ist, in diesem Fall mit einer Klassifizierungsgenauigkeit von bis zu 90 %. *Zweitens*, die auditiven Stimuli hatten vor allem einen Effekt auf die EEGs der gesunden Kontrollen und verkomplizierten die Klassifikation: Die EEGs der gesunden Probanden näherten sich im Koordinatenraum denen der Parkinson-Patienten an und machten eine gemeinsame Trennebene für alle Konditionen ineffektiv.

Mit einer neuen Trennebene für jede Kondition aber unter Nutzung gemeinsamer Kennzeichen konnte erneut eine Klassifizierungsgenauigkeit von 80-90 % und somit sehr gute Unterscheidung beider Gruppen auch unter auditiven Stimuli erreicht werden.

Drittens, die bei weitem wichtigste Gruppe von Kennzeichen zur Unterscheidung beider Gruppen bezog sich auf das Delta Frequenzband (0,5-4 Hz) mit Band-Power, Indices des Delta-Bandes und harmonischen Parametern. Die Zunahme des Delta-Spektrums bei Parkinson deckt sich mit bestehender Literatur, am ehesten im Rahmen einer vermuteten leichten kognitiven Beeinträchtigung. Zudem wird das Delta Frequenzband in der Literatur oft mit Entspannung und Schlaf verknüpft. Die Annäherung der EEGs ist somit am ehesten durch Stimulus-bedingte Entspannung zu erklären. Ein weiteres wichtiges Kennzeichen scheint der Phase Lag Index zu sein. Er wird in der Literatur ebenfalls als Indikator für leichte kognitive Beeinträchtigung erwähnt und nimmt unter dem Einfluss der Stimuli ab. Eine Verbindung zwischen dem Phase Lag Index und funktioneller Konnektivität, wie in der Literatur erwähnt, kann in dieser Arbeit nicht gezeigt werden.

Viertens, die Annäherung der EEGs in Richtung der Erkrankten war besonders deutlich in den Regen-Konditionen, hier kam es zu falsch-Klassifikationen von bis zu 80 %. Dies war sowohl bei der rhythmischen als auch der nicht rhythmischen Variante der Fall. Aufgrund der in der Literatur für die Musiktherapie oft gezeigten Wichtigkeit von Rhythmus scheint die entsprechende Modulation von den Probanden nicht als rhythmisch wahrgenommen worden zu sein. Die Annäherung war weniger deutlich in der Frühlingsspaziergang-Kondition, hier waren zudem auch höhere Frequenzbänder relevant. Auditive Stimuli scheinen also eine Grund-Komplexität zu brauchen, um einen Effekt im EEG zu zeigen.

Aus den Ergebnissen dieser Studie ergeben sich weitere Forschungsansätze. So könnten bei zu erwartender Wichtigkeit des Delta-Bandes längere EEG-Abschnitte als in dieser Studie (3 Sekunden) analysiert werden, um falsche Interpretationen in zu kurzen Abschnitten zu vermeiden. Zudem ist eine Verlangsamung des EEG wahrscheinlich nicht spezifisch für Parkinson. Für eine spezifischere Analyse wäre ein Einbeziehen von Teilnehmern mit nicht Parkinson bedingter kognitiver Einschränkung sinnvoll. Auch das Testen komplexerer Stimuli wie Musik, ein Einbeziehen motorischer Funktionen oder sogar eine Messung der Dopaminspiegel wären weiterhin interessant. Methodisch könnte ein ausgeglicheneres Patientenkollektiv von Vorteil sein.

Um die Wirksamkeit von Musiktherapie im EEG zu zeigen, wäre eine Annäherung der EEGs der Erkrankten in Richtung gesunder Messwerte wünschenswert gewesen. Aufgrund der Entspannung war das Gegenteil der Fall. Die gewählte Methodik allerdings scheint sehr passend. Die Klassifikation beider Gruppen war auf teils sehr hohem Niveau möglich und empfiehlt diese Herangehensweise für weitere Forschung. Aufgrund ihrer Variabilität gilt dies über die Neurologie und sogar über die Medizin hinaus.

7 References

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8 Appendix

a) UPDRS Certificate

International Parkinson and Movement Disorder Society

States that

Matthias Clemens Moeller

has passed the

MDS-UPDRS Training Program & Certificate Exercise

on 14 September 2017

Pablo Martinez-Martin, MD
Co-Chair
MDS Rating Scales Program
International Parkinson and Movement Disorder Society

Glenn Stebbins, PhD
Co-Chair
MDS Rating Scales Program
International Parkinson and Movement Disorder Society

Exam ID: 14436

b) Ethics Protocol

Pacific Parkinson's Research Centre
Centre for Brain Health, UBC Hospital
2215 Wesbrook Mall
Vancouver, B.C. V6T 1Z9
Fax: 604-822-7866

PARTICIPANT INFORMATION AND CONSENT FORM

STUDY TITLE:

EEG-based neurofeedback to alleviate the Parkinsonian state and improve motor function

Place of Study: 2215 Wesbrook Mall
Pacific Parkinson's Research Centre
UBC Hospital, Vancouver, BC
V6T 1Z9

Principal Investigator: Martin McKeown, BEng, MD
Department of Neurology-Medicine
University of British Columbia
Contact phone: (604)-822-7516

Co- Investigators: Silke Cresswell, MD
Z. Jane Wang, PhD

Contact: Christy Jones
(604)-822-9722

Pacific Parkinson's Research Centre
Centre for Brain Health, UBC Hospital
2215 Wesbrook Mall
Vancouver, B.C. V6T 1Z9
Fax: 604-822-7866

Introduction:

You are invited to participate in a research study for Parkinson's disease conducted by the Pacific Parkinson's Research Centre / Vancouver Coastal Health - UBC Site. It is very important that you read and understand the following general principles that apply to all participants in our studies:

a) Participation is entirely voluntary. You have the right to refuse to participate in this study. You do not have to give any reason for your decision. If you decide to participate, you may still choose to withdraw from the study at any time without any negative consequences to the medical care, education, or other services to which you are entitled or are presently receiving

b) You will receive no benefit from participation in the study although knowledge may be gained that will benefit others.

The nature of the study, risks, inconveniences, discomforts, and other pertinent information about the study are discussed below. Please feel free to ask any questions you may have of those discussing the project with you.

Background:

Parkinson's disease (PD) is the 2nd most common neurodegenerative disorder affecting approximately 100,000 Canadians. It is a progressive disorder without a cure that leads to severe motor limitations such as slowness, stiffness, tremor and loss of balance. Non-motor features such as depression, apathy, anxiety, cognitive decline, sleep disorders, impairment of speech and swallowing and other symptoms affect virtually all patients over time. Pharmacological therapies can be quite effective at early stages of the disease, but with the progression of the condition these therapies become ineffective. In addition, most medications are associated with numerous negative side-effects such as: nausea, low blood pressure on standing up, involuntary movements ("dyskinesias"), behavioural complications, hallucinations, confusion, and sedation.

Neurofeedback, which is a type of biofeedback that uses real-time displays of brain activity (such as EEG) to teach self-regulation of the brain, could be used as a non-invasive and non-pharmaceutical treatment. EEG stands for electroencephalography, and it is used to measure electrical activity on the scalp. EEG-neurofeedback has been associated with improvements in a considerable number of medical conditions. Meditation and/or mindfulness has also been found have promise as a treatment in a variety of different diseases, including Parkinson's disease. Therefore, EEG-neurofeedback or mindfulness meditation may be able to improve the symptoms, as well as the clinical status, of patients with PD.

Purpose of the Study:

The purpose of this study is to investigate a non-invasive and non-pharmacological effective therapy for Parkinson's disease, based on neurofeedback. We also want to point out an alternative option of treatment that allows the active participation of patients. In addition, the specific objectives are to determine if patients with Parkinson's disease are able to manipulate EEG feedback signals and the effect of neurofeedback intervention in the motor function of patients.

Study Procedures:

You will come to our Centre for a total of three days of testing, with intervals of one to seven days between testing days. During the testing period you will continue on your anti-PD medication. In the morning of the first day, you will be assessed with a standard clinical test, the MDS-UPDRS, the MoCA, the BDI and the VVIQ (please see page 4 for detailed descriptions), which will take up to an hour. After the clinical assessment, an EEG cap will be fitted on your head, and the recording will be optimized. We will record several minutes of rest EEG data and several minutes of EEG while you listen to audio recordings of nature. During the EEG biofeedback you will see a screen, on which a graph will be displayed. During each block you will be asked to change the height of the graph. You

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will be asked to do so using a variety of different strategies (ie. imagining playing a sport) but without performing actual movements. You will have a number of practice, followed by test trials. You may take breaks from the task whenever you choose. At the end of the first session you will be told what your best strategy was, and will be asked to practice this strategy at home until your next session. Day 2 will have practice and test trials similar to those on day one except that you will only be using your best strategy. Day three is the same as day two, except that you will be asked to perform the MDS-UPDRS and MoCA again after the test period. Complete instructions will be given to you on the first day. If you are uncomfortable about what you have to do before, or during the neurofeedback session, you can ask questions to the research coordinator or any member of the research team present during the training session. If you have any doubts or questions as to what any of the terms used in this consent form, please ask the research coordinator.

Description of Standard Clinical Test:

a) MDS-UPDRS: Unified Parkinson's Disease Rating Scale (UPDRS) is the standard method to evaluate the clinical status of a patient with PD and the stage of the disease. The patient is given a score relative to the severity of the condition in his/her case (for instance, a score of 199 would represent a patient with total disability). The UPDRS is split into six different parts, each evaluating different components (behaviour, mood, motor symptom severity, etc). The UPDRS overall exam, in general, takes 30 minutes to be completed.
b) MoCA: Montreal Cognitive Assessment is the standard method to evaluate mild cognitive impairment and is often used clinically with patients with PD. The assessment is a one page, 30 point test that takes approximately 10 minutes to administer. The MoCA assesses cognitive domains such as short term memory recall, visuospatial abilities, attention, working memory, and language. A higher score is associated with higher cognitive impairment. The exam takes about 10 minutes to complete.
c) BDI: Beck Depression inventory is a self-reported, multiple choice clinical questionnaire with 21 items that is a standard measurement of depression severity and takes a maximum of 15 minutes to complete.
d) VVIQ: The Vividness of Visual Imagery Questionnaire is a measure of individual differences in the vividness of visual imagery. The VVIQ askes the participant to imagine 16 different specific situations and scenes, and then to rate the vividness of the images they created in their mind on a scale of 1 to 5, 5 being most vivid.

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Total Time Commitment: ~4-5 hours divided by three visits, plus time at home to practice (~10-20 mins per day)

VISIT 1:2hrs, VISIT 2: 45mins

VISIT 3: 1hr and 30mins

Inclusion Criteria: To participate, you must meet the following criteria.

- Age between 18 and 85 years
- Confirmed diagnosis of Idiopathic Parkinson's disease
- Mild to moderate Parkinson's disease

Exclusion Criteria: You are not eligible for the study if the following apply

- Depression
- Epilepsy
- Taking sedatives or any EEG altering medication (anti-seizure, benzodiazepines)
- Atypical Parkinsonism
- Severe dementia

Risks:

There are no known physical harms associated with your participation in this study, because EEG is known for being a non-invasive medical tool. However, potential side-effects may happen. According to the medical literature, the side-effects mainly consist of fatigue and anxiety. Therefore, we will provide frequent breaks during the training sessions. If, during the procedure, you feel any discomfort, please do not hesitate to stop. There is no penalty for ending your participation in the study.

Benefits: Participants may or may not benefit directly

The information gathered will enhance our understanding about neurofeedback intervention, and the application of this method in Parkinson's disease; in addition, we will be able to evaluate the success of patients with PD in the manipulation (through EEG signals) of their own brain state. This may lead to a non-invasive and non-pharmacological alternative of treatment to PD.

Confidentiality:

Your confidentiality will be respected. However, research records and health or other source records identifying you may be inspected in the presence of the Investigator or designate and by representatives of the UBC Clinical Research Ethics Board for the purpose of monitoring the research. No information or records that disclose your identity will be published without your consent, nor will any information or records that disclose your identity be removed or released without your consent unless required by law.

You will be assigned a unique study number as a participant in this study. This number will not include any personal information that could identify you (e.g., it will not include your Personal Health Number, SIN, or your initials, etc.). Only this number will be used on any research-related information collected about you during the course of this study, so that your identity will be kept confidential. Information that contains your identity will remain only with the Principal Investigator and/or designate. The list that matches your name to the unique study number that is used on your research-related information will not be removed or released without your consent unless required by law.

Your rights to privacy are legally protected by federal and provincial laws that require safeguards to insure that your privacy is respected. You also have the legal right of access to the information about you that has been provided to the sponsor and, if need be, an opportunity to correct any errors in this information. Further details about these laws are available on request to your study doctor.

Subject's initials: ______

Remuneration:

There will be no charge to you for the research procedures. You will receive no compensation for this study other than reimbursement for travel and parking. Receipts are required in all cases

What if Something Goes Wrong?

By signing this form, you do not give up any of your legal rights and you do not release the study doctor, participating institutions, or anyone else from their legal and professional duties. If you become ill or physically injured as a result of participation in this study, medical treatment will be provided at no additional cost to you. The costs of your medical treatment will be paid by your provincial medical plan.

Contact:

If you have any questions or concerns with respect to this study, you should contact the doctors involved at UBC Hospital (604-822-7516) pager 604 268-0121. If you have any concerns or complaints about your rights as a research subject and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the University of British Columbia Office of Research Services by e-mail at RSIL@ors.ubc.ca or by phone at 604-822-8598 (Toll Free: 1-877-822-8598). Please reference the study number (H14-01772) when calling so the Complaint Line staff can better assist you.

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EEG-based neurofeedback to alleviate the Parkinsonian state and improve motor function

Participant Consent:

I have read and understand the subject information and consent form.

I have had the opportunity to ask questions and have had satisfactory responses to my questions.

I understand that my participation in this study is voluntary and that I am completely free to refuse to participate or to withdraw from this study at any time without changing in any way the quality of care that I receive.

I understand that I am not waiving any of my legal rights as a result of signing this consent form.

I will receive a signed copy of this consent form for my own records.

I consent to participate in this study.

________________________	________________________	__________
Participant's Signature	Print name	Date
________________________	________________________	__________
Principal Investigator or/ Designated representative	Print name	Date

c) Table of Channels in Order of Digitalization

Number	Entry Name	Full Name	Category
1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
7	bpB	Band Power Beta, 12-29 Hz	Band Power
8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
18	FSig1	Fsigma Computation	P-Welch/PSD estimate
19	FSig2	Fsigma Computation	P-Welch/PSD estimate
20	FSig3	Fsigma Computation	P-Welch/PSD estimate
21	FSig4	Fsigma Computation	P-Welch/PSD estimate
22	FSig5	Fsigma Computation	P-Welch/PSD estimate
23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
31	HAct	Hjorth Activity	Hjorth Features
32	HMob	Hjorth Mobility	Hjorth Features
33	HComp	Hjorth Complexity	Hjorth Features
34	Skw	Skewness	Skewness + Kurtosis
35	Kurt	Kurtosis	Skewness + Kurtosis
36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
64	Abt	Alpha+Beta/Total	Bandpower
65	Dtt	Delta+Theta/Total	Bandpower
66	F3F4	Coherence F3-F4	Coherency Features
67	P3P4	Coherence P3-P4	Coherency Features
68	C3C4	Coherence C3-C4	Coherency Features
69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
72	bspR	Alpha+Beta/Delta+Theta	Bandpower

d) Feature Tables Condition No Sound 1

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over all 34 Channels

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
3	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
4	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
5	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
6	67	P3P4	Coherence P3-P4	Coherency Features
7	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
8	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
9	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
10	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
11	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
12	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
13	33	HComp	Hjorth Complexity	Hjorth Features
14	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
15	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
16	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
17	66	F3F4	Coherence F3-F4	Coherency Features
18	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
19	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
20	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
21	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
22	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
23	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
24	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
25	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
26	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
27	31	HAct	Hjorth Activity	Hjorth Features
28	65	dtt	Delta+Theta/Total	Bandpower
29	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
30	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
31	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
32	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
33	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
34	34	Skw	Skewness	Skewness + Kurtosis
35	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
36	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
37	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
38	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
39	32	HMob	Hjorth Mobility	Hjorth Features
40	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
41	35	Kurt	Kurtosis	Skewness + Kurtosis
42	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
43	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
44	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
45	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
46	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
47	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
48	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
49	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
50	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
51	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
52	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
53	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
54	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
55	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
56	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
57	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
58	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
59	7	bpB	Band Power Beta, 12-29 Hz	Band Power
60	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
61	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
62	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
63	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
64	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
65	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
66	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
67	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
68	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
69	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
70	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
71	68	C3C4	Coherence C3-C4	Coherency Features
72	64	abt	Alpha+Beta/Total	Bandpower

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Central Electrodes (FC1, FCZ, FC2, C3, CZ, C4)

Rank	Number	Entry Name	Full Name	Category
1	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
2	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
3	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
4	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
5	31	HAct	Hjorth Activity	Hjorth Features
6	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
7	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
8	33	HComp	Hjorth Complexity	Hjorth Features
9	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
10	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
11	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
12	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
13	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
14	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
15	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
16	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
17	67	P3P4	Coherence P3-P4	Coherency Features
18	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
19	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
20	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
21	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
22	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
23	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
24	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
25	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
26	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
27	32	HMob	Hjorth Mobility	Hjorth Features
28	65	dtt	Delta+Theta/Total	Bandpower
29	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
30	66	F3F4	Coherence F3-F4	Coherency Features
31	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
32	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
33	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
34	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
35	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
36	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
37	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
38	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
39	35	Kurt	Kurtosis	Skewness + Kurtosis
40	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
41	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
42	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
43	34	Skw	Skewness	Skewness + Kurtosis
44	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
45	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
46	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
47	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
48	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
49	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
50	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
51	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
52	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
53	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
54	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
55	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
56	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
57	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
58	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
59	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
60	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
61	64	abt	Alpha+Beta/Total	Bandpower
62	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
63	7	bpB	Band Power Beta, 12-29 Hz	Band Power
64	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
65	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
66	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
67	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
68	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
69	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
70	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
71	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
72	68	C3C4	Coherence C3-C4	Coherency Features

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Frontal Electrodes (FP1, FPZ, FP2, FZ)

Rank	Number	Entry Name	Full Name	Category
1	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
2	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
3	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
4	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
5	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
6	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
7	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
8	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
9	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
10	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
11	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
12	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
13	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
14	67	P3P4	Coherence P3-P4	Coherency Features
15	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
16	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
17	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
18	64	abt	Alpha+Beta/Total	Bandpower
19	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
20	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
21	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
22	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
23	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
24	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
25	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
26	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
27	66	F3F4	Coherence F3-F4	Coherency Features
28	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
29	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
30	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
31	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
32	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
33	65	dtt	Delta+Theta/Total	Bandpower
34	31	HAct	Hjorth Activity	Hjorth Features
35	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
36	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
37	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
38	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
39	35	Kurt	Kurtosis	Skewness + Kurtosis
40	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
41	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
42	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
43	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
44	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
45	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
46	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
47	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
48	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
49	32	HMob	Hjorth Mobility	Hjorth Features
50	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
51	33	HComp	Hjorth Complexity	Hjorth Features
52	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
53	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
54	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
55	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
56	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
57	34	Skw	Skewness	Skewness + Kurtosis
58	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
59	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
60	7	bpB	Band Power Beta, 12-29 Hz	Band Power
61	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
62	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
63	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
64	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS
65	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
66	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
67	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
68	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
69	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
70	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
71	68	C3C4	Coherence C3-C4	Coherency Features
72	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Temporal Left Electrodes (F7, F3, FC5, T7, CP5, P7)

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
3	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
4	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
5	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
6	67	P3P4	Coherence P3-P4	Coherency Features
7	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
8	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
9	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
10	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
11	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
12	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
13	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
14	31	HAct	Hjorth Activity	Hjorth Features
15	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
16	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
17	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
18	32	HMob	Hjorth Mobility	Hjorth Features
19	66	F3F4	Coherence F3-F4	Coherency Features
20	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
21	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
22	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
23	33	HComp	Hjorth Complexity	Hjorth Features
24	35	Kurt	Kurtosis	Skewness + Kurtosis
25	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
26	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
27	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
28	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
29	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
30	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
31	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
32	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
33	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
34	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
35	34	Skw	Skewness	Skewness + Kurtosis
36	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
37	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
38	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
39	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
40	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
41	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
42	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
43	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
44	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
45	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
46	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
47	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
48	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
49	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
50	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
51	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
52	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
53	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
54	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
55	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
56	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
57	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
58	65	dtt	Delta+Theta/Total	Bandpower
59	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
60	7	bpB	Band Power Beta, 12-29 Hz	Band Power
61	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
62	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
63	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
64	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
65	64	abt	Alpha+Beta/Total	Bandpower
66	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
67	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
68	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
69	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
70	68	C3C4	Coherence C3-C4	Coherency Features
71	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
72	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Temporal Right Electrodes (F8, F4, FC6, T8, CP6, P8)

Rank	Number	Entry Name	Full Name	Category
1	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
2	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
3	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
4	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
5	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
6	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
7	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
8	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
9	67	P3P4	Coherence P3-P4	Coherency Features
10	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
11	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
12	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
13	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
14	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
15	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
16	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
17	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
18	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
19	66	F3F4	Coherence F3-F4	Coherency Features
20	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
21	65	dtt	Delta+Theta/Total	Bandpower
22	35	Kurt	Kurtosis	Skewness + Kurtosis
23	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
24	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
25	32	HMob	Hjorth Mobility	Hjorth Features
26	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
27	33	HComp	Hjorth Complexity	Hjorth Features
28	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
29	31	HAct	Hjorth Activity	Hjorth Features
30	34	Skw	Skewness	Skewness + Kurtosis
31	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
32	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
33	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
34	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
35	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
36	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
37	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
38	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
39	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
40	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
41	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
42	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
43	7	bpB	Band Power Beta, 12-29 Hz	Band Power
44	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
45	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
46	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
47	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
48	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
49	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
50	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
51	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
52	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
53	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
54	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
55	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
56	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
57	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
58	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
59	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
60	64	abt	Alpha+Beta/Total	Bandpower
61	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
62	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
63	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
64	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
65	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
66	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
67	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
68	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
69	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
70	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
71	68	C3C4	Coherence C3-C4	Coherency Features
72	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Parietal Left Electrodes (CP1, CPZ, PZ, P3)

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
3	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
4	67	P3P4	Coherence P3-P4	Coherency Features
5	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
6	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
7	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
8	33	HComp	Hjorth Complexity	Hjorth Features
9	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
10	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
11	66	F3F4	Coherence F3-F4	Coherency Features
12	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
13	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
14	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
15	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
16	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
17	32	HMob	Hjorth Mobility	Hjorth Features
18	31	HAct	Hjorth Activity	Hjorth Features
19	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
20	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
21	34	Skw	Skewness	Skewness + Kurtosis
22	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
23	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
24	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
25	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
26	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
27	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
28	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
29	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
30	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
31	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
32	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
33	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
34	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
35	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
36	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
37	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
38	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
39	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
40	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
41	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
42	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
43	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
44	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
45	7	bpB	Band Power Beta, 12-29 Hz	Band Power
46	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
47	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
48	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
49	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
50	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
51	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
52	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
53	35	Kurt	Kurtosis	Skewness + Kurtosis
54	65	dtt	Delta+Theta/Total	Bandpower
55	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
56	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
57	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
58	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
59	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
60	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
61	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
62	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
63	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
64	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
65	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
66	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
67	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
68	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
69	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
70	64	abt	Alpha+Beta/Total	Bandpower
71	68	C3C4	Coherence C3-C4	Coherency Features
72	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Parietal Right Electrodes (CP2, CPZ, PZ, P4)

Rank	Number	Entry Name	Full Name	Category
1	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
2	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
3	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
4	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
5	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
6	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
7	67	P3P4	Coherence P3-P4	Coherency Features
8	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
9	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
10	35	Kurt	Kurtosis	Skewness + Kurtosis
11	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
12	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
13	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
14	66	F3F4	Coherence F3-F4	Coherency Features
15	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
16	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
17	32	HMob	Hjorth Mobility	Hjorth Features
18	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
19	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
20	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
21	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
22	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
23	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
24	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
25	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
26	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
27	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
28	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
29	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
30	31	HAct	Hjorth Activity	Hjorth Features
31	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
32	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
33	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
34	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
35	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
36	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
37	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
38	33	HComp	Hjorth Complexity	Hjorth Features
39	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
40	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
41	34	Skw	Skewness	Skewness + Kurtosis
42	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
43	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
44	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
45	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
46	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
47	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
48	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
49	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
50	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
51	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
52	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
53	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
54	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
55	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
56	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
57	7	bpB	Band Power Beta, 12-29 Hz	Band Power
58	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
59	64	abt	Alpha+Beta/Total	Bandpower
60	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
61	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
62	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
63	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
64	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
65	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
66	65	dtt	Delta+Theta/Total	Bandpower
67	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
68	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
69	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
70	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
71	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
72	68	"C3C4"	Coherence C3-C4	Coherency Features

Table MIQ of all 72 Features in Condition 1 (NS1), Mean over Occipital Electrodes (PO5, POZ, PO6, O1, OZ, O2)

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
3	67	P3P4	Coherence P3-P4	Coherency Features
4	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
5	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
6	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
7	66	F3F4	Coherence F3-F4	Coherency Features
8	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
9	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
10	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
11	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
12	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
13	35	Kurt	Kurtosis	Skewness + Kurtosis
14	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
15	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
16	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
17	64	abt	Alpha+Beta/Total	Bandpower
18	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
19	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
20	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
21	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
22	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
23	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
24	31	HAct	Hjorth Activity	Hjorth Features
25	34	Skw	Skewness	Skewness + Kurtosis
26	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
27	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
28	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
29	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
30	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
31	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
32	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
33	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
34	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
35	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
36	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
37	32	HMob	Hjorth Mobility	Hjorth Features
38	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
39	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
40	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
41	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
42	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
43	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
44	65	dtt	Delta+Theta/Total	Bandpower
45	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
46	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
47	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
48	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
49	33	HComp	Hjorth Complexity	Hjorth Features
50	7	bpB	Band Power Beta, 12-29 Hz	Band Power
51	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
52	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
53	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
54	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
55	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
56	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
57	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
58	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
59	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
60	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
61	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
62	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
63	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
64	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
65	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
66	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
67	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
68	68	C3C4	Coherence C3-C4	Coherency Features
69	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
70	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
71	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
72	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)

e) Feature Tables Condition Rain 1

Table MIQ of all 72 Features in Condition 2 (Rain 1), Mean over all 34 Channels

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
3	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
4	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
5	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
6	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
7	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
8	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
9	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
10	28	DSI	Delta Slow Wave Index, (Delta/Theta+Alpha)	Slow Wave Index
11	66	F3F4	Coherence F3-F4	Coherency Features
12	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
13	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
14	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
15	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
16	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
17	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
18	67	P3P4	Coherence P3-P4	Coherency Features
19	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
20	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
21	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
22	29	TSI	Theta Slow Wave Index, (Theta/Delta+Alpha)	Slow Wave Index
23	65	Dtt	Delta+Theta/Total	Bandpower
24	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
25	33	HComp	Hjorth Complexity	Hjorth Features
26	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
27	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
28	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
29	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
30	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
31	31	HAct	Hjorth Activity	Hjorth Features
32	35	Kurt	Kurtosis	Skewness + Kurtosis
33	34	Skw	Skewness	Skewness + Kurtosis
34	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
35	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
36	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
37	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
38	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
39	68	C3C4	Coherence C3-C4	Coherency Features
40	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
41	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
42	30	ASI	Alpha Slow Wave Index, (Alpha/Delta2+Theta)	Slow Wave Index
43	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
44	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
45	32	HMob	Hjorth Mobility	Hjorth Features
46	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
47	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
48	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
49	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
50	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
51	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
52	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
53	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
54	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
55	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
56	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
57	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
58	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
59	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
60	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
61	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
62	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
63	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
64	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
65	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
66	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
67	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
68	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
69	64	Abt	Alpha+Beta/Total	Bandpower
70	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
71	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
72	7	bpB	Band Power Beta, 12-29 Hz	Band Power

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Central Electrodes (FC1, FCZ, FC2, C3, CZ, C4)

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
3	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
4	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
5	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
6	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
7	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
8	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
9	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
10	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
11	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
12	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
13	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
14	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
15	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
16	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
17	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
18	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
19	66	F3F4	Coherence F3-F4	Coherency Features
20	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
21	33	HComp	Hjorth Complexity	Hjorth Features
22	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
23	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
24	67	P3P4	Coherence P3-P4	Coherency Features
25	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
26	35	Kurt	Kurtosis	Skewness + Kurtosis
27	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
28	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
29	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
30	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
31	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
32	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
33	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
34	31	HAct	Hjorth Activity	Hjorth Features
35	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
36	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
37	32	HMob	Hjorth Mobility	Hjorth Features
38	65	Dtt	Delta+Theta/Total	Bandpower
39	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
40	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
41	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
42	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
43	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
44	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
45	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
46	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
47	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
48	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
49	30	ASI	Alpha Slow Wave Index, (Alpha/Delta2+Theta)	Slow Wave Index
50	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
51	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
52	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
53	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
54	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
55	68	C3C4	Coherence C3-C4	Coherency Features
56	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
57	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
58	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
59	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
60	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
61	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
62	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
63	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
64	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
65	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
66	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
67	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
68	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
69	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
70	64	Abt	Alpha+Beta/Total	Bandpower
71	7	bpB	Band Power Beta, 12-29 Hz	Band Power
72	34	Skw	Skewness	Skewness + Kurtosis

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Frontal Electrodes (FP1, FPZ, FP2, FZ)

Rank	Number	Entry Name	Full Name	Category
1	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
2	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
3	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
4	28	DSI	Delta Slow Wave Index(Delta/Theta+Alpha)	Slow Wave Index
5	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
6	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
7	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
8	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
9	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
10	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
11	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
12	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
13	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
14	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
15	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
16	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
17	66	F3F4	Coherence F3-F4	Coherency Features
18	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
19	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
20	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
21	64	Abt	Alpha+Beta/Total	Bandpower
22	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
23	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
24	65	Dtt	Delta+Theta/Total	Bandpower
25	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
26	67	P3P4	Coherence P3-P4	Coherency Features
27	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
28	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
29	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
30	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
31	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
32	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
33	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
34	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
35	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
36	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
37	32	Hmob	Hjorth Mobility	Hjorth Features
38	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
39	35	Kurt	Kurtosis	Skewness + Kurtosis
40	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
41	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
42	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
43	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
44	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
45	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
46	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
47	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
48	33	Hcomp	Hjorth Complexity	Hjorth Features
49	18	Fsig1	Fsigma Computation	P-Welch/PSD estimate
50	68	C3C4	Coherence C3-C4	Coherency Features
51	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
52	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
53	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
54	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
55	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
56	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
57	19	Fsig2	Fsigma Computation	P-Welch/PSD estimate
58	7	bpB	Band Power Beta, 12-29 Hz	Band Power
59	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
60	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
61	34	Skw	Skewness	Skewness + Kurtosis
62	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
63	31	Hact	Hjorth Activity	Hjorth Features
64	21	Fsig4	Fsigma Computation	P-Welch/PSD estimate
65	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
66	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
67	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
68	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
69	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
70	22	Fsig5	Fsigma Computation	P-Welch/PSD estimate
71	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
72	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Temporal Left Electrodes (F7, F3, FC5, T7, CP5, P7)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	Phase Lag Index (PLI)
2	69	"F3P3"	"PLI F3-P3"	Phase Lag Index (PLI)
3	35	"Kurt"	"Kurtosis"	Skewness + Kurtosis
4	38	"Bspc3"	"Absolute Value BTS (61)"	Bispectrum Time Series (BTS)
5	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	Band Power
6	71	"F4P4"	"PLI F4-P4"	Phase Lag Index (PLI)
7	37	"Bspc2"	"Absolute Value BTS (57)"	Bispectrum Time Series (BTS)
8	66	"F3F4"	"Coherence F3-F4"	Coherency Features
9	62	"Wvl7"	"Wavelet Coefficient Level 7"	Wavelet Coefficients
10	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	Band Power
11	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	Slow Wave Index
12	67	"P3P4"	"Coherence P3-P4"	Coherency Features
13	57	"Wvl2"	"Wavelet Coefficient Level 2"	Wavelet Coefficients
14	24	"SFc2"	"S(Fc) Computation"	P-Welch/PSD estimate
15	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	Slow Wave Index
16	36	"Bspc1"	"Absolute Value BTS (53)"	Bispectrum Time Series (BTS)
17	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	Band Power
18	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	Band Power
19	58	"Wvl3"	"Wavelet Coefficient Level 3"	Wavelet Coefficients
20	15	"Fc3"	"Fc Computation Alpha"	P-Welch/PSD estimate
21	23	"SFc1"	"S(Fc) Computation"	P-Welch/PSD estimate
22	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	Band Power
23	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	Band Power
24	34	"Skw"	"Skewness"	Skewness + Kurtosis
25	27	"SFc5"	"S(Fc) Computation"	P-Welch/PSD estimate
26	39	"Bspc4"	"Absolute Value BTS (65)"	Bispectrum Time Series (BTS)
27	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	Band Power
28	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	Band Power
29	61	"Wvl6"	"Wavelet Coefficient Level 6"	Wavelet Coefficients
30	33	"HComp"	"Hjorth Complexity"	Hjorth Features
31	63	"Wvl8"	"Wavelet Coefficient Level 8"	Wavelet Coefficients
32	26	"SFc4"	"S(Fc) Computation"	P-Welch/PSD estimate
33	68	"C3C4"	"Coherence C3-C4"	Coherency Features
34	14	"Fc2"	"Fc Computation Theta"	P-Welch/PSD estimate
35	72	"bspR"	"Alpha+Beta/Delta+Theta"	Bandpower
36	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	Band Power
37	19	"FSig2"	"Fsigma Computation"	P-Welch/PSD estimate
38	47	"gBspc2"	"Phase Angle BTS (57)"	Bispectrum Time Series (BTS)
39	16	"Fc4"	"Fc Computation Beta"	P-Welch/PSD estimate
40	31	"HAct"	"Hjorth Activity"	Hjorth Features
41	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	Band Power
42	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	Band Power
43	25	"SFc3"	"S(Fc) Computation"	P-Welch/PSD estimate
44	17	"Fc5"	"Fc Computation Gamma"	P-Welch/PSD estimate
45	60	"Wvl5"	"Wavelet Coefficient Level 5"	Wavelet Coefficients
46	44	"Bspc9"	"Absolute Value BTS (74)"	Bispectrum Time Series (BTS)
47	49	"gBspc4"	"Phase Angle BTS (65)"	Bispectrum Time Series (BTS)
48	43	"Bspc8"	"Absolute Value BTS (73)"	Bispectrum Time Series (BTS)
49	45	"Bspc10"	"Absolute Value BTS (76)"	Bispectrum Time Series (BTS)
50	65	"dtt"	"Delta+Theta/Total"	Bandpower
51	40	"Bspc5"	"Absolute Value BTS (70)"	Bispectrum Time Series (BTS)
52	56	"Wvl1"	"Wavelet Coefficient Level 1"	Wavelet Coefficients
53	13	"Fc1"	"Fc Computation Delta"	P-Welch/PSD estimate
54	42	"Bspc7"	"Absolute Value BTS (72)"	Bispectrum Time Series (BTS)
55	59	"Wvl4"	"Wavelet Coefficient Level 4"	Wavelet Coefficients
56	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	Slow Wave Index
57	20	"FSig3"	"Fsigma Computation"	P-Welch/PSD estimate
58	22	"FSig5"	"Fsigma Computation"	P-Welch/PSD estimate
59	41	"Bspc6"	"Absolute Value BTS (71)"	Bispectrum Time Series (BTS)
60	32	"HMob"	"Hjorth Mobility"	Hjorth Features
61	21	"FSig4"	"Fsigma Computation"	P-Welch/PSD estimate
62	64	"abt"	"Alpha+Beta/Total"	Bandpower
63	52	"gBspc7"	"Phase Angle BTS (72)"	Bispectrum Time Series (BTS)
64	50	"gBspc5"	"Phase Angle BTS (70)"	Bispectrum Time Series (BTS)
65	46	"gBspc1"	"Phase Angle BTS (53)"	Bispectrum Time Series (BTS)
66	55	"gBspc10"	"Phase Angle BTS (76)"	Bispectrum Time Series (BTS)
67	53	"gBspc8"	"Phase Angle BTS (73)"	Bispectrum Time Series (BTS)
68	7	"bpB"	"Band Power Beta, 12-29 Hz"	Band Power
69	18	"FSig1"	"Fsigma Computation"	P-Welch/PSD estimate
70	48	"gBspc3"	"Phase Angle BTS (61)"	Bispectrum Time Series (BTS)
71	51	"gBspc6"	"Phase Angle BTS (71)"	Bispectrum Time Series (BTS)
72	54	"gBspc9"	"Phase Angle BTS (74)"	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Temporal Right Electrodes (F8, F4, FC6, T8, CP6, P8)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
4	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
5	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
6	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
7	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
8	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
9	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
10	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
11	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
12	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
13	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
14	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
15	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
16	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
17	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
18	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
19	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
20	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
21	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
22	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
23	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
24	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
25	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
26	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
27	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
28	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
29	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
30	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
31	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
32	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
33	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
34	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
35	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
36	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
37	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
38	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
39	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
40	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
41	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
42	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
43	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
44	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
45	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
46	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
47	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
48	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
49	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
50	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
51	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
52	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
53	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
54	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
55	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
56	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
57	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
58	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
59	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
60	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
61	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
62	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
63	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
64	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
65	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
66	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
67	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
68	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
69	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
70	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
71	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
72	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Parietal Left Electrodes (CP1, CPZ, PZ, P3)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
4	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
5	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
6	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
7	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
8	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
9	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
10	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
11	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
12	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
13	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
14	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
15	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
16	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
17	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
18	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
19	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
20	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
21	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
22	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
23	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
24	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
25	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
26	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
27	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
28	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
29	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
30	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
31	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
32	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
33	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
34	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
35	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
36	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
37	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
38	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
39	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
40	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
41	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
42	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
43	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
44	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
45	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
46	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
47	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
48	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
49	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
50	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
51	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
52	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
53	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
54	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
55	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
56	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
57	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
58	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
59	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
60	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
61	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
62	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
63	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
64	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
65	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
66	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
67	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
68	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
69	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
70	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
71	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
72	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Parietal Right Electrodes (CP2, CPZ, PZ, P4)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
3	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
4	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
5	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
6	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
7	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
8	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
9	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
10	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
11	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
12	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
13	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
14	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
15	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
16	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
17	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
18	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
19	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
20	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
21	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
22	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
23	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
24	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
25	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
26	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
27	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
28	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
29	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
30	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
31	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
32	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
33	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
34	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
35	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
36	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
37	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
38	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
39	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
40	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
41	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
42	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
43	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
44	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
45	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
46	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
47	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
48	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
49	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
50	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
51	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
52	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
53	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
54	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
55	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
56	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
57	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
58	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
59	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
60	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
61	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
62	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
63	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
64	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
65	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
66	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
67	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
68	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
69	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
70	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
71	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
72	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"

Table MIQ of all 72 Features in Condition 2 (R1), Mean over Occipital Electrodes (PO5, POZ, PO6, O1, OZ, O2)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
4	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
5	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
6	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
7	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
8	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
9	72	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
10	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
11	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
12	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
13	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
14	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
15	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
16	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
17	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
18	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
19	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
20	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
21	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
22	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
23	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
24	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
25	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
26	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
27	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
28	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
29	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
30	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
31	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
32	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
33	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
34	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
35	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
36	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
37	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
38	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
39	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
40	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
41	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
42	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
43	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
44	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
45	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
46	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
47	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
48	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
49	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
50	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
51	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
52	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
53	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
54	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
55	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
56	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
57	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
58	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
59	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
60	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
61	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
62	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
63	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
64	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
65	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
66	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
67	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
68	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
69	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
70	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
71	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
72	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"

f) Feature Tables Condition Spring Walk

Table MIQ of all 72 Features in Condition 3 (SW), Mean over all 34 Channels

Rank	Number	Entry Name	Full Name	Category
1	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
2	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
3	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
4	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
5	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
6	66	F3F4	Coherence F3-F4	Coherency Features
7	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
8	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
9	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
10	32	HMob	Hjorth Mobility	Hjorth Features
11	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
12	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
13	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
14	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
15	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
16	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
17	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
18	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
19	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
20	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
21	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
22	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
23	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
24	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
25	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
26	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
27	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
28	68	C3C4	Coherence C3-C4	Coherency Features
29	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
30	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
31	33	HComp	Hjorth Complexity	Hjorth Features
32	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
33	65	Dtt	Delta+Theta/Total	Bandpower
34	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
35	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
36	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
37	31	HAct	Hjorth Activity	Hjorth Features
38	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
39	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
40	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
41	35	Kurt	Kurtosis	Skewness + Kurtosis
42	34	Skw	Skewness	Skewness + Kurtosis
43	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
44	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
45	67	P3P4	Coherence P3-P4	Coherency Features
46	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
47	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
48	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
49	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
50	64	Abt	Alpha+Beta/Total	Bandpower
51	7	bpB	Band Power Beta, 12-29 Hz	Band Power
52	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
53	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
54	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
55	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
56	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
57	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
58	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
59	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
60	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
61	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
62	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
63	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
64	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
65	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
66	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
67	30	ASI	Alpha Slow Wave Index(Alpha/Delta2+Theta)	Slow Wave Index
68	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
69	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
70	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
71	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
72	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Central Electrodes (FC1, FCZ, FC2, C3, CZ, C4)

Rank	Number	Entry Name	Full Name	Category
1	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
2	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
3	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
4	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
5	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
6	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
7	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
8	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
9	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
10	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
11	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
12	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
13	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
14	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
15	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
16	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
17	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
18	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
19	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
20	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
21	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
22	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
23	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
24	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
25	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
26	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
27	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
28	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
29	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
30	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
31	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
32	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
33	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
34	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
35	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
36	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
37	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
38	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
39	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
40	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
41	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
42	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
43	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
44	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
45	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
46	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
47	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
48	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
49	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
50	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
51	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
52	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
53	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
54	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
55	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
56	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
57	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
58	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
59	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
60	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
61	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
62	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
63	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
64	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
65	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
66	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
67	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
68	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
69	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
70	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
71	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
72	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Frontal Electrodes (FP1, FPZ, FP2, FZ)

Rank	Number	Entry Name	Full Name	Category
1	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
4	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
5	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
6	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
7	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
8	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
9	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
10	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
11	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
12	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
13	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
14	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
15	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
16	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
17	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
18	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
19	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
20	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
21	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
22	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
23	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
24	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
25	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
26	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
27	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
28	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
29	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
30	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
31	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
32	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
33	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
34	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
35	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
36	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
37	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
38	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
39	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
40	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
41	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
42	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
43	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
44	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
45	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
46	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
47	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
48	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
49	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
50	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
51	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
52	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
53	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
54	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
55	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
56	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
57	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
58	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
59	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
60	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
61	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
62	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
63	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
64	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
65	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
66	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
67	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
68	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
69	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
70	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
71	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
72	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Temporal Left Electrodes (F7, F3, FC5, T7, CP5, P7)

Rank	Number	Entry Name	Full Name	Category
1	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
2	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
3	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
4	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
5	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
6	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
7	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
8	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
9	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
10	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
11	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
12	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
13	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
14	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
15	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
16	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
17	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
18	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
19	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
20	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
21	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
22	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
23	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
24	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
25	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
26	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
27	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
28	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
29	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
30	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
31	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
32	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
33	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
34	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
35	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
36	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
37	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
38	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
39	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
40	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
41	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
42	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
43	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
44	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
45	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
46	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
47	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
48	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
49	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
50	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
51	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
52	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
53	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
54	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
55	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
56	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
57	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
58	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
59	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
60	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
61	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
62	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
63	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
64	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
65	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
66	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
67	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
68	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
69	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
70	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
71	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
72	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Temporal Right Electrodes (F8, F4, FC6, T8, CP6, P8)

Rank	Number	Entry Name	Full Name	Category
1	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
4	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
5	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
6	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
7	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
8	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
9	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
10	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
11	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
12	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
13	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
14	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
15	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
16	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
17	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
18	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
19	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
20	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
21	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
22	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
23	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
24	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
25	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
26	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
27	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
28	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
29	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
30	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
31	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
32	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
33	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
34	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
35	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
36	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
37	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
38	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
39	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
40	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
41	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
42	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
43	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
44	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
45	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
46	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
47	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
48	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
49	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
50	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
51	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
52	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
53	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
54	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
55	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
56	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
57	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
58	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
59	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
60	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
61	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
62	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
63	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
64	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
65	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
66	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
67	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
68	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
69	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
70	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
71	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
72	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Parietal Left Electrodes (CP1, CPZ, PZ, P3)

Rank	Number	Entry Name	Full Name	Category
1	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
4	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
5	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
6	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
7	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
8	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
9	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
10	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
11	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
12	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
13	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
14	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
15	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
16	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
17	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
18	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
19	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
20	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
21	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
22	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
23	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
24	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
25	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
26	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
27	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
28	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
29	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
30	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
31	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
32	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
33	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
34	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
35	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
36	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
37	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
38	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
39	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
40	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
41	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
42	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
43	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
44	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
45	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
46	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
47	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
48	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
49	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
50	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
51	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
52	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
53	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
54	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
55	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
56	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
57	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
58	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
59	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
60	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
61	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
62	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
63	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
64	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
65	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
66	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
67	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
68	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
69	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
70	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
71	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
72	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Parietal Right Electrodes (CP2, CPZ, PZ, P4)

Rank	Number	Entry Name	Full Name	Category
1	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
2	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
3	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
4	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
5	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
6	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
7	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
8	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
9	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
10	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
11	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
12	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
13	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
14	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
15	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
16	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
17	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
18	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
19	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
20	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
21	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
22	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
23	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
24	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
25	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
26	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
27	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
28	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
29	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
30	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
31	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
32	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
33	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
34	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
35	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
36	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
37	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
38	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
39	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
40	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
41	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
42	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
43	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
44	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
45	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
46	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
47	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
48	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
49	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
50	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
51	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
52	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
53	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
54	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
55	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
56	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
57	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
58	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
59	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
60	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
61	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
62	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
63	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
64	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
65	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
66	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
67	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
68	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
69	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
70	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
71	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
72	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 3 (SW), Mean over Occipital Electrodes (PO5, POZ, PO6, O1, OZ, O2)

Rank	Number	Entry Name	Full Name	Category
1	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
2	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
3	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
4	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
5	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
6	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
7	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
8	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
9	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
10	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
11	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
12	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
13	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
14	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
15	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
16	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
17	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
18	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
19	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
20	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
21	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
22	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
23	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
24	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
25	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
26	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
27	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
28	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
29	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
30	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
31	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
32	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
33	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
34	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
35	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
36	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
37	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
38	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
39	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
40	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
41	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
42	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
43	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
44	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
45	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
46	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
47	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
48	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
49	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
50	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
51	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
52	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
53	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
54	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
55	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
56	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
57	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
58	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
59	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
60	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
61	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
62	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
63	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
64	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
65	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
66	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
67	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
68	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
69	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
70	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
71	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
72	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"

g) Feature Tables Condition Rain 2

Table MIQ of all 72 Features in Condition 4 (Rain 2), Mean over all 34 Channels

Rank	Number	Entry Name	Full Name	Category
1	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
2	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
3	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
4	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
5	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
6	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
7	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
8	68	C3C4	Coherence C3-C4	Coherency Features
9	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
10	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
11	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
12	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
13	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
14	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
15	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
16	65	Dtt	Delta+Theta/Total	Bandpower
17	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
18	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
19	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
20	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
21	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
22	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
23	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
24	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
25	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
26	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
27	33	HComp	Hjorth Complexity	Hjorth Features
28	32	HMob	Hjorth Mobility	Hjorth Features
29	67	P3P4	Coherence P3-P4	Coherency Features
30	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
31	35	Kurt	Kurtosis	Skewness + Kurtosis
32	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
33	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
34	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
35	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
36	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
37	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
38	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
39	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
40	7	bpB	Band Power Beta, 12-29 Hz	Band Power
41	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
42	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
43	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
44	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
45	66	F3F4	Coherence F3-F4	Coherency Features
46	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)
47	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
48	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
49	31	HAct	Hjorth Activity	Hjorth Features
50	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
51	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
52	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
53	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
54	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
55	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
56	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
57	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
58	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
59	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
60	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
61	34	Skw	Skewness	Skewness + Kurtosis
62	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
63	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
64	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
65	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
66	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
67	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
68	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
69	64	Abt	Alpha+Beta/Total	Bandpower
70	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
71	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
72	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 4 (R2) Mean over Central Electrodes (FC1, FCZ, FC2, C3, CZ, C4)

Rank	Number	Entry Name	Full Name	Category
1	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
2	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
3	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
4	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
5	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
6	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
7	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
8	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
9	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
10	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
11	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
12	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
13	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
14	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
15	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
16	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
17	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
18	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
19	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
20	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
21	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
22	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
23	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
24	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
25	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
26	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
27	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
28	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
29	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
30	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
31	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
32	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
33	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
34	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
35	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
36	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
37	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
38	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
39	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
40	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
41	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
42	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
43	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
44	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
45	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
46	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
47	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
48	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
49	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
50	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
51	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
52	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
53	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
54	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
55	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
56	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
57	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
58	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
59	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
60	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
61	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
62	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
63	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
64	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
65	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
66	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
67	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
68	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
69	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
70	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
71	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
72	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 4 (R2), Mean over Frontal Electrodes (FP1, FPZ, FP2, FZ)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
3	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
4	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
5	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
6	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
7	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
8	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
9	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
10	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
11	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
12	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
13	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
14	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
15	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
16	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
17	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
18	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
19	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
20	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
21	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
22	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
23	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
24	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
25	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
26	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
27	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
28	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
29	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
30	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
31	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
32	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
33	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
34	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
35	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
36	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
37	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
38	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
39	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
40	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
41	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
42	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
43	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
44	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
45	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
46	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
47	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
48	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
49	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
50	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
51	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
52	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
53	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
54	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
55	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
56	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
57	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
58	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
59	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
60	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
61	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
62	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
63	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
64	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
65	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
66	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
67	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
68	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
69	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
70	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
71	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
72	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 4 (R2), Mean over Temporal Left Electrodes (F7, F3, FC5, T7, CP5, P7)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
3	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
4	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
5	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
6	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
7	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
8	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
9	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
10	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
11	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
12	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
13	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
14	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
15	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
16	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
17	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
18	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
19	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
20	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
21	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
22	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
23	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
24	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
25	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
26	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
27	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
28	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
29	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
30	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
31	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
32	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
33	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
34	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
35	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
36	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
37	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
38	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
39	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
40	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
41	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
42	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
43	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
44	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
45	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
46	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
47	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
48	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
49	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
50	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
51	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
52	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
53	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
54	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
55	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
56	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
57	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
58	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
59	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
60	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
61	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
62	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
63	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
64	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
65	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
66	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
67	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
68	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
69	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
70	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
71	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
72	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 4 (R2), Mean over Temporal Right Electrodes (F8, F4, FC6, T8, CP6, P8)

Rank	Number	Entry Name	Full Name	Category
1	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
2	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
3	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
4	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
5	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
6	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
7	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
8	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
9	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
10	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
11	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
12	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
13	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
14	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
15	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
16	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
17	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
18	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
19	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
20	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
21	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
22	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
23	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
24	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
25	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
26	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
27	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
28	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
29	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
30	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
31	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
32	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
33	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
34	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
35	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
36	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
37	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
38	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
39	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
40	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
41	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
42	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
43	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
44	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
45	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
46	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
47	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
48	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
49	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
50	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
51	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
52	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
53	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
54	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
55	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
56	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
57	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
58	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
59	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
60	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
61	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
62	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
63	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
64	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
65	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
66	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
67	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
68	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
69	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
70	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
71	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
72	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 4 (R2), Mean over Parietal Left Electrodes (CP1, CPZ, PZ, P3)

Rank	Number	Entry Name	Full Name	Category
1	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
2	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
3	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
4	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
5	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
6	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
7	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
8	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
9	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
10	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
11	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
12	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
13	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
14	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
15	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
16	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
17	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
18	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
19	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
20	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
21	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
22	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
23	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
24	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
25	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
26	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
27	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
28	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
29	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
30	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
31	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
32	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
33	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
34	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
35	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
36	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
37	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
38	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
39	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
40	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
41	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
42	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
43	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
44	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
45	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
46	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
47	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
48	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
49	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
50	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
51	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
52	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
53	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
54	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
55	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
56	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
57	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
58	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
59	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
60	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
61	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
62	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
63	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
64	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
65	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
66	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
67	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
68	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
69	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
70	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
71	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
72	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 4 (R2), Mean over Parietal Right Electrodes (CP2, CPZ, PZ, P4)

Rank	Number	Entry Name	Full Name	Category
1	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
2	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
3	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
4	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
5	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
6	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
7	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
8	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
9	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
10	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
11	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
12	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
13	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
14	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
15	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
16	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
17	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
18	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
19	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
20	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
21	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
22	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
23	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
24	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
25	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
26	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
27	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
28	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
29	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
30	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
31	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
32	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
33	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
34	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
35	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
36	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
37	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
38	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
39	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
40	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
41	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
42	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
43	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
44	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
45	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
46	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
47	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
48	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
49	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
50	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
51	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
52	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
53	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
54	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
55	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
56	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
57	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
58	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
59	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
60	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
61	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
62	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
63	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
64	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
65	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
66	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
67	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
68	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
69	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
70	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
71	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
72	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 4 (R2), Mean over Occipital Electrodes (PO5, POZ, PO6, O1, OZ, O2)

Rank	Number	Entry Name	Full Name	Category
1	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
2	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
3	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
4	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
5	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
6	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
7	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
8	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
9	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
10	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
11	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
12	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
13	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
14	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
15	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
16	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
17	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
18	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
19	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
20	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
21	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
22	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
23	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
24	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
25	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
26	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
27	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
28	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
29	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
30	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
31	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
32	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
33	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
34	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
35	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
36	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
37	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
38	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
39	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
40	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
41	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
42	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
43	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
44	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
45	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
46	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
47	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
48	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
49	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
50	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
51	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
52	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
53	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
54	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
55	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
56	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
57	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
58	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
59	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
60	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
61	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
62	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
63	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
64	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
65	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
66	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
67	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
68	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
69	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
70	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
71	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
72	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"

h) Feature Tables Condition No Sound 2

Table MIQ of all 72 Features in Condition 5 (No Sound 2), Mean over all 34 Channels

1

Rank	Number	Entry Name	Full Name	Category
1	23	SFc1	S(Fc) Computation	P-Welch/PSD estimate
2	38	Bspc3	Absolute Value BTS (61)	Bispectrum Time Series (BTS)
3	39	Bspc4	Absolute Value BTS (65)	Bispectrum Time Series (BTS)
4	1	bpD1	Band Power Delta 1, 0.5-2 Hz	Band Power
5	37	Bspc2	Absolute Value BTS (57)	Bispectrum Time Series (BTS)
6	66	F3F4	Coherence F3-F4	Coherency Features
7	65	dtt	Delta+Theta/Total	Bandpower
8	8	bpLG	Band Power Low Gamma, 30-60 Hz	Band Power
9	14	Fc2	Fc Computation Theta	P-Welch/PSD estimate
10	31	HAct	Hjorth Activity	Hjorth Features
11	35	Kurt	Kurtosis	Skewness + Kurtosis
12	70	FZPZ	PLI FZ-PZ	Phase Lag Index (PLI)
13	36	Bspc1	Absolute Value BTS (53)	Bispectrum Time Series (BTS)
14	24	SFc2	S(Fc) Computation	P-Welch/PSD estimate
15	18	FSig1	Fsigma Computation	P-Welch/PSD estimate
16	13	Fc1	Fc Computation Delta	P-Welch/PSD estimate
17	28	DSI	Delta Slow Wave Index (Delta/Theta+Alpha)	Slow Wave Index
18	5	bpA1	Band Power Alpha 1, 8-10 Hz	Band Power
19	49	gBspc4	Phase Angle BTS (65)	Bispectrum Time Series (BTS)
20	2	bpD2	Band Power Delta 2, 2-4 Hz	Band Power
21	58	Wvl3	Wavelet Coefficient Level 3	Wavelet Coefficients
22	29	TSI	Theta Slow Wave Index (Theta/Delta+Alpha)	Slow Wave Index
23	69	F3P3	PLI F3-P3	Phase Lag Index (PLI)
24	33	HComp	Hjorth Complexity	Hjorth Features
25	60	Wvl5	Wavelet Coefficient Level 5	Wavelet Coefficients
26	68	C3C4	Coherence C3-C4	Coherency Features
27	26	SFc4	S(Fc) Computation	P-Welch/PSD estimate
28	71	F4P4	PLI F4-P4	Phase Lag Index (PLI)
29	4	bpT2	Band Power Theta 2, 6-8 Hz	Band Power
30	19	FSig2	Fsigma Computation	P-Welch/PSD estimate
31	57	Wvl2	Wavelet Coefficient Level 2	Wavelet Coefficients
32	15	Fc3	Fc Computation Alpha	P-Welch/PSD estimate
33	63	Wvl8	Wavelet Coefficient Level 8	Wavelet Coefficients
34	62	Wvl7	Wavelet Coefficient Level 7	Wavelet Coefficients
35	40	Bspc5	Absolute Value BTS (70)	Bispectrum Time Series (BTS)
36	3	bpT1	Band Power Theta 1, 4-6 Hz	Band Power
37	32	HMob	Hjorth Mobility	Hjorth Features
38	45	Bspc10	Absolute Value BTS (76)	Bispectrum Time Series (BTS)
39	34	Skw	Skewness	Skewness + Kurtosis
40	48	gBspc3	Phase Angle BTS (61)	Bispectrum Time Series (BTS)
41	72	bspR	Alpha+Beta/Delta+Theta	Bandpower
42	46	gBspc1	Phase Angle BTS (53)	Bispectrum Time Series (BTS)
43	27	SFc5	S(Fc) Computation	P-Welch/PSD estimate
44	67	P3P4	Coherence P3-P4	Coherency Features
45	10	bpLE	Band Power Low Epsilon, 91-120 Hz	Band Power
46	16	Fc4	Fc Computation Beta	P-Welch/PSD estimate
47	43	Bspc8	Absolute Value BTS (73)	Bispectrum Time Series (BTS)
48	44	Bspc9	Absolute Value BTS (74)	Bispectrum Time Series (BTS)
49	50	gBspc5	Phase Angle BTS (70)	Bispectrum Time Series (BTS)
50	41	Bspc6	Absolute Value BTS (71)	Bispectrum Time Series (BTS)
51	54	gBspc9	Phase Angle BTS (74)	Bispectrum Time Series (BTS)
52	20	FSig3	Fsigma Computation	P-Welch/PSD estimate
53	9	bpHG	Band Power High Gamma, 61-90 Hz	Band Power
54	21	FSig4	Fsigma Computation	P-Welch/PSD estimate
55	11	bpHE	Band Power High Epsilon, 121-150 Hz	Band Power
56	42	Bspc7	Absolute Value BTS (72)	Bispectrum Time Series (BTS)
57	51	gBspc6	Phase Angle BTS (71)	Bispectrum Time Series (BTS)
58	52	gBspc7	Phase Angle BTS (72)	Bispectrum Time Series (BTS)
59	22	FSig5	Fsigma Computation	P-Welch/PSD estimate
60	30	ASI	Alpha Slow Wave Index (Alpha/Delta2+Theta)	Slow Wave Index
61	7	bpB	Band Power Beta, 12-29 Hz	Band Power
62	53	gBspc8	Phase Angle BTS (73)	Bispectrum Time Series (BTS)
63	12	bpBrA	Band Power Broadband Act, 151-249 Hz	Band Power
64	17	Fc5	Fc Computation Gamma	P-Welch/PSD estimate
65	61	Wvl6	Wavelet Coefficient Level 6	Wavelet Coefficients
66	6	bpA2	Band Power Alpha 2, 10-12 Hz	Band Power
67	55	gBspc10	Phase Angle BTS (76)	Bispectrum Time Series (BTS)
68	56	Wvl1	Wavelet Coefficient Level 1	Wavelet Coefficients
69	64	abt	Alpha+Beta/Total	Bandpower
70	59	Wvl4	Wavelet Coefficient Level 4	Wavelet Coefficients
71	25	SFc3	S(Fc) Computation	P-Welch/PSD estimate
72	47	gBspc2	Phase Angle BTS (57)	Bispectrum Time Series (BTS)

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Central Electrodes (FC1, FCZ, FC2, C3, CZ, C4)

Rank	Number	Entry Name	Full Name	Category
1	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
2	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
3	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
4	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
5	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
6	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
7	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
8	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
9	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
10	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
11	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
12	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
13	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
14	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
15	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
16	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
17	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
18	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
19	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
20	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
21	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
22	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
23	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
24	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
25	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
26	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
27	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
28	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
29	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
30	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
31	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
32	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
33	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
34	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
35	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
36	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
37	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
38	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
39	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
40	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
41	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
42	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
43	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
44	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
45	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
46	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
47	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
48	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
49	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
50	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
51	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
52	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
53	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
54	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
55	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
56	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
57	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
58	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
59	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
60	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
61	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
62	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
63	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
64	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
65	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
66	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
67	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
68	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
69	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
70	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
71	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
72	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Frontal Electrodes (FP1, FPZ, FP2, FZ)

Rank	Number	Entry Name	Full Name	Category
1	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
2	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
3	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
4	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
5	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
6	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
7	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
8	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
9	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
10	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
11	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
12	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
13	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
14	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
15	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
16	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
17	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
18	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
19	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
20	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
21	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
22	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
23	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
24	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
25	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
26	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
27	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
28	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
29	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
30	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
31	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
32	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
33	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
34	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
35	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
36	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
37	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
38	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
39	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
40	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
41	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
42	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
43	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
44	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
45	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
46	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
47	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
48	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
49	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
50	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
51	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
52	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
53	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
54	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
55	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
56	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
57	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
58	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
59	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
60	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
61	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
62	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
63	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
64	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
65	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
66	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
67	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
68	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
69	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
70	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
71	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
72	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Temporal Left Electrodes (F7, F3, FC5, T7, CP5, P7)

Rank	Number	Entry Name	Full Name	Category
1	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
2	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
3	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
4	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
5	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
6	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
7	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
8	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
9	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
10	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
11	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
12	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
13	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
14	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
15	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
16	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
17	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
18	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
19	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
20	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
21	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
22	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
23	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
24	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
25	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
26	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
27	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
28	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
29	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
30	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
31	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
32	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
33	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
34	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
35	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
36	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
37	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
38	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
39	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
40	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
41	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
42	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
43	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
44	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
45	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
46	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
47	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
48	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
49	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
50	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
51	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
52	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
53	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
54	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
55	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
56	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
57	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
58	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
59	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
60	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
61	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
62	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
63	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
64	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
65	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
66	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
67	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
68	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
69	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
70	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
71	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
72	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Temporal Right Electrodes (F8, F4, FC6, T8, CP6, P8)

Rank	Number	Entry Name	Full Name	Category
1	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
2	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
3	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
4	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
5	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
6	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
7	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
8	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
9	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
10	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
11	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
12	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
13	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
14	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
15	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
16	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
17	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
18	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
19	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
20	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
21	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
22	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
23	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
24	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
25	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
26	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
27	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
28	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
29	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
30	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
31	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
32	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
33	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
34	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
35	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
36	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
37	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
38	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
39	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
40	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
41	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
42	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
43	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
44	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
45	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
46	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
47	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
48	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
49	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
50	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
51	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
52	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
53	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
54	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
55	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
56	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
57	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
58	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
59	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
60	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
61	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
62	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
63	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
64	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
65	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
66	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
67	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
68	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
69	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
70	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
71	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
72	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Parietal Left Electrodes (CP1, CPZ, PZ, P3)

Rank	Number	Entry Name	Full Name	Category
1	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
2	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
3	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
4	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
5	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
6	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
7	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
8	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
9	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
10	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
11	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
12	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
13	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
14	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
15	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
16	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
17	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
18	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
19	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
20	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
21	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
22	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
23	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
24	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
25	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
26	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
27	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
28	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
29	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
30	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
31	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
32	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
33	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
34	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
35	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
36	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
37	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
38	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
39	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
40	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
41	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
42	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
43	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
44	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
45	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
46	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
47	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
48	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
49	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
50	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
51	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
52	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
53	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
54	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
55	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
56	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
57	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
58	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
59	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
60	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
61	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
62	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
63	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
64	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
65	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
66	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
67	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
68	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
69	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
70	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
71	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
72	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Parietal Right Electrodes (CP2, CPZ, PZ, P4)

Rank	Number	Entry Name	Full Name	Category
1	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
2	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
3	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
4	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
5	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
6	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
7	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
8	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
9	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
10	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
11	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
12	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
13	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
14	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
15	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
16	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
17	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
18	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
19	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
20	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
21	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
22	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
23	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
24	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
25	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
26	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
27	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
28	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
29	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
30	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
31	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
32	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
33	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
34	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
35	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
36	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
37	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
38	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
39	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
40	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
41	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
42	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
43	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
44	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
45	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
46	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
47	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
48	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
49	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
50	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
51	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
52	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
53	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
54	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
55	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
56	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
57	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
58	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
59	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
60	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
61	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
62	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
63	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
64	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
65	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
66	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
67	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
68	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
69	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
70	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
71	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"
72	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"

Table MIQ of all 72 Features in Condition 5 (NS2), Mean over Occipital Electrodes (PO5, POZ, PO6, O1, OZ, O2)

Rank	Number	Entry Name	Full Name	Category
1	66	"F3F4"	"Coherence F3-F4"	"Coherency Features"
2	38	"Bspc3"	"Absolute Value BTS (61)"	"Bispectrum Time Series (BTS)"
3	46	"gBspc1"	"Phase Angle BTS (53)"	"Bispectrum Time Series (BTS)"
4	23	"SFc1"	"S(Fc) Computation"	"P-Welch/PSD estimate"
5	37	"Bspc2"	"Absolute Value BTS (57)"	"Bispectrum Time Series (BTS)"
6	39	"Bspc4"	"Absolute Value BTS (65)"	"Bispectrum Time Series (BTS)"
7	18	"FSig1"	"Fsigma Computation"	"P-Welch/PSD estimate"
8	70	"FZPZ"	"PLI FZ-PZ"	"Phase Lag Index (PLI)"
9	2	"bpD2"	"Band Power Delta 2, 2-4 Hz"	"Band Power"
10	13	"Fc1"	"Fc Computation Delta"	"P-Welch/PSD estimate"
11	1	"bpD1"	"Band Power Delta 1, 0.5-2 Hz"	"Band Power"
12	36	"Bspc1"	"Absolute Value BTS (53)"	"Bispectrum Time Series (BTS)"
13	47	"gBspc2"	"Phase Angle BTS (57)"	"Bispectrum Time Series (BTS)"
14	69	"F3P3"	"PLI F3-P3"	"Phase Lag Index (PLI)"
15	35	"Kurt"	"Kurtosis"	"Skewness + Kurtosis"
16	8	"bpLG"	"Band Power Low Gamma, 30-60 Hz"	"Band Power"
17	68	"C3C4"	"Coherence C3-C4"	"Coherency Features"
18	71	"F4P4"	"PLI F4-P4"	"Phase Lag Index (PLI)"
19	48	"gBspc3"	"Phase Angle BTS (61)"	"Bispectrum Time Series (BTS)"
20	63	"Wvl8"	"Wavelet Coefficient Level 8"	"Wavelet Coefficients"
21	43	"Bspc8"	"Absolute Value BTS (73)"	"Bispectrum Time Series (BTS)"
22	44	"Bspc9"	"Absolute Value BTS (74)"	"Bispectrum Time Series (BTS)"
23	72	"bspR"	"Alpha+Beta/Delta+Theta"	"Bandpower"
24	49	"gBspc4"	"Phase Angle BTS (65)"	"Bispectrum Time Series (BTS)"
25	3	"bpT1"	"Band Power Theta 1, 4-6 Hz"	"Band Power"
26	15	"Fc3"	"Fc Computation Alpha"	"P-Welch/PSD estimate"
27	65	"dtt"	"Delta+Theta/Total"	"Bandpower"
28	45	"Bspc10"	"Absolute Value BTS (76)"	"Bispectrum Time Series (BTS)"
29	40	"Bspc5"	"Absolute Value BTS (70)"	"Bispectrum Time Series (BTS)"
30	67	"P3P4"	"Coherence P3-P4"	"Coherency Features"
31	41	"Bspc6"	"Absolute Value BTS (71)"	"Bispectrum Time Series (BTS)"
32	42	"Bspc7"	"Absolute Value BTS (72)"	"Bispectrum Time Series (BTS)"
33	57	"Wvl2"	"Wavelet Coefficient Level 2"	"Wavelet Coefficients"
34	30	"ASI"	"Alpha Slow Wave Index (Alpha/Delta2+Theta)"	"Slow Wave Index"
35	27	"SFc5"	"S(Fc) Computation"	"P-Welch/PSD estimate"
36	56	"Wvl1"	"Wavelet Coefficient Level 1"	"Wavelet Coefficients"
37	19	"FSig2"	"Fsigma Computation"	"P-Welch/PSD estimate"
38	62	"Wvl7"	"Wavelet Coefficient Level 7"	"Wavelet Coefficients"
39	26	"SFc4"	"S(Fc) Computation"	"P-Welch/PSD estimate"
40	29	"TSI"	"Theta Slow Wave Index (Theta/Delta+Alpha)"	"Slow Wave Index"
41	24	"SFc2"	"S(Fc) Computation"	"P-Welch/PSD estimate"
42	25	"SFc3"	"S(Fc) Computation"	"P-Welch/PSD estimate"
43	9	"bpHG"	"Band Power High Gamma, 61-90 Hz"	"Band Power"
44	6	"bpA2"	"Band Power Alpha 2, 10-12 Hz"	"Band Power"
45	22	"FSig5"	"Fsigma Computation"	"P-Welch/PSD estimate"
46	34	"Skw"	"Skewness"	"Skewness + Kurtosis"
47	14	"Fc2"	"Fc Computation Theta"	"P-Welch/PSD estimate"
48	20	"FSig3"	"Fsigma Computation"	"P-Welch/PSD estimate"
49	21	"FSig4"	"Fsigma Computation"	"P-Welch/PSD estimate"
50	58	"Wvl3"	"Wavelet Coefficient Level 3"	"Wavelet Coefficients"
51	5	"bpA1"	"Band Power Alpha 1, 8-10 Hz"	"Band Power"
52	16	"Fc4"	"Fc Computation Beta"	"P-Welch/PSD estimate"
53	59	"Wvl4"	"Wavelet Coefficient Level 4"	"Wavelet Coefficients"
54	10	"bpLE"	"Band Power Low Epsilon, 91-120 Hz"	"Band Power"
55	33	"HComp"	"Hjorth Complexity"	"Hjorth Features"
56	60	"Wvl5"	"Wavelet Coefficient Level 5"	"Wavelet Coefficients"
57	7	"bpB"	"Band Power Beta, 12-29 Hz"	"Band Power"
58	11	"bpHE"	"Band Power High Epsilon, 121-150 Hz"	"Band Power"
59	51	"gBspc6"	"Phase Angle BTS (71)"	"Bispectrum Time Series (BTS)"
60	32	"HMob"	"Hjorth Mobility"	"Hjorth Features"
61	55	"gBspc10"	"Phase Angle BTS (76)"	"Bispectrum Time Series (BTS)"
62	28	"DSI"	"Delta Slow Wave Index (Delta/Theta+Alpha)"	"Slow Wave Index"
63	61	"Wvl6"	"Wavelet Coefficient Level 6"	"Wavelet Coefficients"
64	17	"Fc5"	"Fc Computation Gamma"	"P-Welch/PSD estimate"
65	64	"abt"	"Alpha+Beta/Total"	"Bandpower"
66	54	"gBspc9"	"Phase Angle BTS (74)"	"Bispectrum Time Series (BTS)"
67	50	"gBspc5"	"Phase Angle BTS (70)"	"Bispectrum Time Series (BTS)"
68	12	"bpBrA"	"Band Power Broadband Act, 151-249 Hz"	"Band Power"
69	52	"gBspc7"	"Phase Angle BTS (72)"	"Bispectrum Time Series (BTS)"
70	4	"bpT2"	"Band Power Theta 2, 6-8 Hz"	"Band Power"
71	31	"HAct"	"Hjorth Activity"	"Hjorth Features"
72	53	"gBspc8"	"Phase Angle BTS (73)"	"Bispectrum Time Series (BTS)"

j) Verzeichnis der akademischen Lehrer/-innen

Meine akademischen Lehrenden waren in Marburg:

Bartsch, Becker, Becker, Cetin, Czubayko, Daut, Dettmeyer, Feuser, Fritz, Geraedts, Gress, Hertl, Hofmann, Hoyer, Kinscherf, Kircher, Kruse, Lill, Lohoff, Mahnken, Maier, Moll, Nenadić, Neubauer, Neumüller, Nimsky, Oliver, Opitz, Pagenstecher, Peterlein, Rastan, Renz, Richter, Ruchholz, Sahmland, Schieffer, Schneider, Schratt, Seitz, Sekundo, Stuck, Thieme, Timmermann, Timmesfeld, Vogelmeier, Wagner, Weber, Weihe, Worzfeld, Wrocklage, Wulf

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