Note:

This is a sample report! The purpose of this sample report is solely to show the idea of how the report looks like.

BrainFitness
Balance Focus Calm

FUNCTIONAL BRAIN MAPPING RESULTS REPORT

Functional Brain State Assessment and Neurofeedback Recommendations

Quantitative Electroencephalography (QEEG), Functional Brain Biomarkers and localization of possible deviations from HBImed normative database with standardized Low-Resolution Electromagnetic Tomography

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Scientific Analysis of an Individual Brain Functioning

(QEEG and ERP)

This report presented an analysis that contained results of analytics and interpretations performed by qualified researchers and is based on the published scientific evidence.

Name/ID	
Birthdate (day, month, year)	01.01.2000
Gender (M - male, F - female)	M
Handedness (R, L)	R

Diagnose

Reason of having Brain Mapping assessment

Medication

Assessment day

Important

This report provides an indication of the general state of the individual brain functioning. The results of this analysis should be considered together with other measures in assessing, diagnosing, and treating clients.

The information described here can be misunderstood by the common person without special education in the field of brain functioning.

The information contained in the present document is not intended to be used as a medical conclusion and should NOT be used as a basis for self-treatment.

The information presented in this report aimed to be used ONLY by the neurofeedback professionals for better understanding of individual pattern of electrophysiological activity of the brain as a guide in terms of providing the most appropriate location and frequency for neurofeedback interventions.

However, there are no guarantees that neurofeedback by itself is going to lead to the resolution of any underlying symptoms. Neurofeedback intervention should be carefully evaluated and constantly monitored.

Please note that the medications can modify EEG findings and ideally the EEG should be taken under as medication free conditions as possible.

With the delivery and reading of this report the referral requesting this service agrees with the terms and conditions and assumes all responsibility for any inconvenience.

Summary of Findings

We would like to point out that the therapeutic approach must be holistic and should include various aspects of life. This implies regarding not only cognition, behavior and emotions, but also biological aspects. How exactly this change-strategy should be designed is far beyond the scope of this report. However, we consider that difficulties must be addressed by a multimodal approach that takes into consideration aspects of both the individual and the surrounding social network.

Based on the extensive analysis of the brain electrical activity, identified QEEG deviations associated with general under activation and functional brain de-regulation due to slow brain maturation especially in the frontal and posterior brain areas involved in the executive control of behavior.

These types of deviations are often presented in the DS patients and associated with symptoms of mental impairment, inattention, increased anxiety and decreased emotion and behavior inhibition control.

Functional Brain Biomarkers:

- Overall decreased of arousal. These types of deviations associated with in ADHD symptoms (inattention, impulsivity, emotional instability).

Mayer K, Wyckoff SN, Strehl U. Underarousal in Adult ADHD: How Are Peripheral and Cortical Arousal Related? Clin EEG Neurosci. 2016 Jul;47(3):171-9. doi: 10.1177/1550059415577544. Epub 2015 Mar 23. PMID: 25802473.

- An increased index of inattention found to be associated with ADHD symptoms and related with increased level of inattention, problem with emotion control and impulsivity. Increased index of inattention and overall decreased of arousal often found in ADHD.

Mayer K, Wyckoff SN, Strehl U. Underarousal in Adult ADHD: How Are Peripheral and Cortical Arousal Related? Clin EEG Neurosci. 2016 Jul;47(3):171-9. doi: 10.1177/1550059415577544. Epub 2015 Mar 23. PMID: 25802473.

- General decreased in coherence associated with decreased functional brain activation state and represent decreased alertness state (drowsiness). Decreased coherence in the frontal areas in the right frontal-temporal areas can be related with symptoms of emotional reactivity, mania, aggression and psychosis. Altered functional connectivity in the motor and prefrontal cortex found in DS.

Brain Electromagnetic Tomography (neuropsychology):

- Deviations in the Medial Frontal Gyrus Frontal Lobe previously associated with childhood trauma.
- Abnormalities within Brodmann areas 6 were previously found in patients with ADHD symptoms.
- BA7 participate in attention switch and damage in these areas may cause a neglect syndrome or sensory inattention, with impaired attention to stimuli in the contralateral half of the visual field. Deviations in these areas were associated with developmental disability and ASD symptoms. Deviation in BA7 often associated with sleep symptoms. Clinical

observation demonstrates that the damage in the left superior parietal lobe BA5/7 is associated with ideomotor apraxia (loss of the ability to produce purposeful, skilled movements as the result of brain pathology not caused by weakness, paralysis, lack of coordination, or sensory loss). Astereognosis (or tactile agnosia: loss of the ability to recognize objects by handling them) is found in cases of damage in the association sensorimotor cortex.

Brain Information Processing

- Psychophysiological VCPT scores are within the normal range in reference to Attention, Impulsivity Reaction time, and Response consistency.
- Deviations during sensory information processing were found in a form of high activation of emotional regulation system, which results in hypersensitivity (high pain sensitivity), overly enhanced monitoring, intense assimilation and processing of information, intense emotional feelings, thoughts and behaviors and a high degree of emotionalization in everyday life. Intense detail-oriented and emotionally loaded memory retrieval results in exhaustion slow and intense emotional processing, intense emotional conflicts, uncertainty and irritation.
- High energy expenditure to achieve goals leads to fatigue in terms of achieving objectives. High level of inner involvement, either due to intense conflicts and intense emotional processing or abnormalities in the tonic activation system (too high activation of reticular system).
- Excessive monitoring and control of processing leads to recurrent subprocesses, e.g. in memory recall or association processes.

Recommendations

Frequency - Based Neurofeedback protocol:

In eyes opened condition

- Fz/Cz– reinforce activity at (15-18 Hz) with subsequent decrease of low and high activity (3-15 and 18-30 Hz).
- Pz/C4– reinforce activity at (12-15 Hz) with subsequent decrease of low and high activity (3-12 and 15-30 Hz).
- T6/O2– reinforce activity at (12-15 Hz) with subsequent decrease of low and high activity (3-12 and 15-30 Hz).

In eyes closed condition (can be done with eye open condition in case of DS)

- O1-O1 – reinforce alpha activity (10 - 12 Hz)

Infra Low Frequency protocol (Othmer's Method)

In eyes opened condition

- T4-P4 – relaxation, body awareness, body tension and discomfort
- T4-O2 – emotional calming
- T3-F7 - motivation, attention

Biofeedback training (HRV) is recommended

These suggestions are given in according with QEEG results and offered as a starting point for Neurofeedback training. Individual client responses will vary. The specific frequencies, montages, and the sequencing of sessions will likely require modification based on clinical response. Suggestions may be implemented differently depending on instrumentation used.

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Scientific Consultant: X-clinic – Clinic of Adaptation Medicine, St. Petersburg, Russia

Results

Psychological Evaluation

Base on the analysis of the "Personal and clinical data – Questionnaire" symptoms were found in the executive and affective systems.

EEG Description

Description of background EEG	Dominant activity within delta[1] and theta[2] frequency range, EEG is poorly organized with normal amplitude from 30 to 60 μV. Moderate diffuse changes with signs of neurophysiological immaturity.
Pathological signs	No significant abnormalities identified by visual inspection of EEG or by automated spike detection algorithm

Quantitative EEG-analysis (QEEG), comparison with the HBImed normative database

Theta/beta relation Index of inattention		Index of inattention significantly increased = 10 (norm 2)
QEEG analysis	**Eyes open**	Increased level of the relative delta power spectra in the left central and in the right occipital-temporal areas. Increased level of the theta power spectra in the orbital-frontal, frontal, temporal, right central, parietal, and occipital areas.
Asymmetry	**Eyes open**	No significant asymmetry found
Coherence	**Eyes open**	Decreased coherence in the orbital-frontal, frontal, frontal-parietal, parietal and occipital areas in the eyes opened condition and suggest that there is a lack of communication between the sites.

[1]***Deltha rhythm*** is a slow EEG oscillation presented within frequency range 1.5 – 3 Hz that is normally occurs in deep sleep (stage 3 and 4), deeply relaxed states and drowsiness. It is a dominant rhythm in infants up to one year of age. In adults this rhythm can be related with developmental disability or, in case of local presence, reflect physiological abnormalities (traumatic brain injury, stroke, tumor etc.) and coma states.

[2]***Theta rhythm*** is a slow EEG rhythm within frequency band of 3.5-7.5 Hz. This rhythm is normal during the sleep, it is associated with internal focus, daydreaming, fantasizing, meditation. It is normal in children up to 13 years old depending on distribution. Significant increase in the frontal areas can be associated with ADHD symptoms**.**

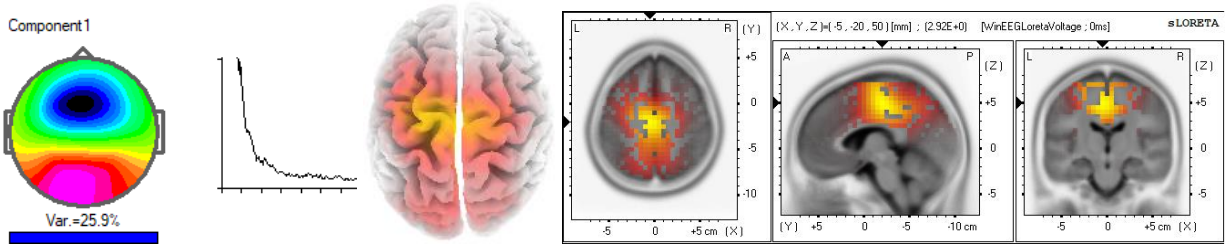
Alpha rhythm is EEG activity within 8-12 Hz. This rhythm occurs when the brain is alert, but relaxed and tranquil. This rhythm is stronger over the occipital areas

Beta rhythm occurs within 13 – 30 Hz. This rhythm is most prominent over frontal areas and associated with thinking, problem solving, decision making etc.

Brain Mapping, sLORETA (Low Resolution Brain Electromagnetic Tomography)

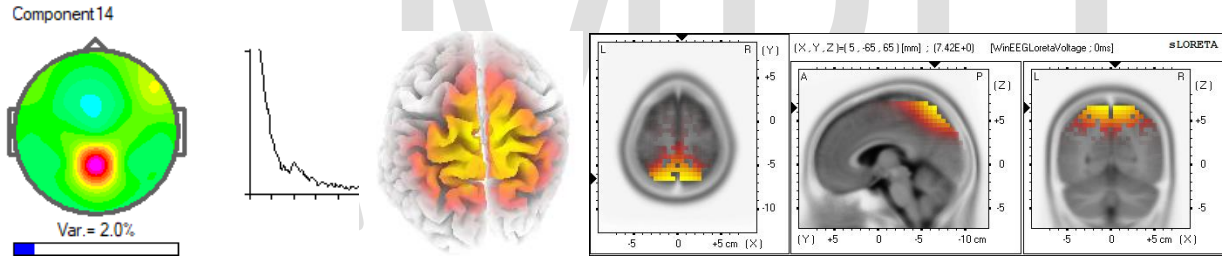
Following deviations were calculated for biggest deviations

In eyes open



(X= -5, Y= -20, Z= 50) (MNI coords) Best Match at 0 mm

Brodmann area 31 Paracentral Lobule frontal Lobe: The cingulate cortex has been described as a neural interface between emotion, sensation, and action. Posterior cingulate gyrus is active when learning a complex motor skill. The posterior cingulate gyrus is activated during language tasks (e.g., lexico-semantic processing) and it play a significant role in emotion (e.g., fear conditioning), in different types of memory (e.g., topographic memory, episodic memory, etc.).



(X= 5, Y= -65, Z= 65) (MNI coords) Best Match at 0 mm

Brodmann area 7 Precuneus parietal Lobe: this area represents the end of the cingulum and is involved in a broad variety of functions:
Awareness: the precuneus is essential for conscious information processing.
Default-mode network: the default network is responsible for the awake resting state of the brain; the ventral precuneus is part of this network, meaning that self-awareness and self-perception are important components of the default network.
Parietal-prefrontal-central network: The precuneus is part of the frontoparietal network, which oversees activating many cognitive and emotional functions.
Visual and sensory association area functions. Speech comprehension in the dominant hemisphere. This association cortex integrates somatosensory information with visual, auditory and vestibular information, enabling spatial localization of objects. This spatial perception is the basis for directed eye-, hand- and body movements; it provides sensory information fundamental for complex directed movements.

VCPT (visual continuous performance task)

Performance in visual continuous performance task

VCPT (visual continuous performance task)
Performance in visual continuous performance task

Subject responses – green, normative database – red, statistical comparison - blue

Group name		Omisson	Comission	RT1	SE(RT1)
Statistical comparison	a-a GO [D]	p=0.670	0.00%	p=0.552	p=0.844
	a-p NoGO [D]	0.00%	p=0.709	0	0.0
Subject	a-a GO [1]	1.00%	0.00%	470	9.7
	a-p NoGO [1]	0.00%	0.00%	0	0.0
Normative database	a-a GO [2]	1.79%	0.00%	414	9.1
	a-p NoGO [2]	0.00%	0.47%	0	0.0

Overview: performance within normal range.

Brain Information Processing Event Related Potentials (ERP), comparison with the HBImed normative database

Input areas:

P1N1 - Visual input

High intensity of information processing triggered by emotional drive, which is usually leads to a kind of hypersensitivity.

N1P2 - Aud. Novelty

Brain reacts too strongly to the sound. This is often observed in people with hypersensitivity that is often associated with enhanced monitoring and excessive sensing, e.g. high pain sensitivity.

P1N1 vTL - Left association areas

Intense detail-oriented association processes causes fast abatement, exhaustion, or functional disorders (e.g. slow information processing) that is usually associated with an excessive monitoring and results in exhaustion.

P1N1 vTR - Right association areas

Association processes are emotionally loaded even when there is no reason for it. This results in unnecessary intense emotional conflicts. Slow and intense emotional processing.

Memory areas:

V com TL - Left memory areas

High activation and overly detail-oriented approach causes fast abatement, exhaustion or functional disorders (e.g. slow information processing).

V com TR - Right memory areas

Comparison processes are emotionally loaded even when there is no reason for it, which results in unnecessary intensive emotional conflicts.

Intense emotionally loaded memory retrieval, whichis usually associated with intense emotional conflicts and excessive monitoring. This results in uncertainty and irritation.

High activation of emotional regulation, which is usually associated with emotionally loaded processing in everyday life.

Executive control areas:

P3b - Activation operation

Intense activation of sensory input channels. A high energy expenditure to achieve goals. This often leads to fatigue in terms of achieving objectives.

High level of inner involvement, either due to intense conflicts or intense emotional processing. Late high amplitudes are often accompanied by abnormalities in the tonic activation system (too high activation).

P3a - Inhibition/Suppression

High amplitudes in inhibition/suppression functions indicate that the control over sensory processes is dysfunctional. Often high amplitudes in primary input areas are observed. This leads to intense assimilation and processing of information.

High amplitudes of mid potentials in inhibition processes indicate excessive monitoring and control of processing. This leads to recurrent subprocesses, e.g. in memory recall or association processes.

p4 monCC - Conflict monitoring

Intense sensory assimilation and information processing due to limbic (emotional) contents. This means that when a high level of stress is experienced, this inner experience influences sensory processing.

High activation of limbic energy during appraisal of action alternatives. Monitoring is collaterally affected by inner stress.

Attachment

Introduction

This type of assessment examines the overall pattern of the brain electrical activity (EEG) that reflects the general brain activation state. Functional brain states represent the general brain activation balance, i.e. relationship between excitatory and inhibitory processes. Activation or excitation linked to increase in neuronal activation, whereas inhibition understood as decreased in neuronal activation. The balance between these processes determined the ability to perform and adapt to environmental changes. Persistent imbalance or dysregulation found in a number of pathological conditions and specific changes can be linked to specific psychological and behavioral symptoms.

Description of the QEEG and ERPs data

Procedures of EEG recording and analysis

EEG was recorded by means of the Mitsar (Mitsar, Ltd.) amplifier[1] from 19 electrodes (Fp1, Fp2, F7, F3, Fz, F4, F8, T3, C3, Cz, C4, T4, T5, P3, Pz, P4, T6, O1, O2 sites in the International 10-20 system) with 250 Hz sampling rate in 0.3 – 70 Hz frequency range in the following conditions: 1) eyes opened (EO) – at least 5 minutes, 2) eyes closed (EC) – at least 5 minutes, and 3) a modification of GO/NOO task (20 minutes).

The data were stored on the hard disk in the linked ears reference montage and processed offline by means of WinEEG software. The software is based on the 30 years' experience obtained in the laboratory at the Institute of the Human Brain of Russian Academy of Sciences.

Absolute and relative magnitude spectra and coherences in all conditions computed and compared with the parameters of a corresponding age group from the Human Brain Index (HBI) reference database. The reference database includes data of about 1000 healthy people of 7-89 years old age.

The analysis consists of the following steps:

1) eye movement artifact correction and elimination: a) using spatial filtration technique based on zeroing the activation curves of individual Independent Component Analysis (ICA) components corresponding to horizontal and vertical eye movements, as well as b) excluding epochs with excessive amplitude of EEG and excessive faster and slower frequency activity;

2) Fast-Fourier Transformation (FFT) of the corrected EEG for extracting EEG power and coherence for all 0.25 Hz bins in the frequency band from 0.5 to 30 Hz.

3) computation of event related potentials by averaging EEG over trials for each category of trial and each channel with time resolution of 4 ms.

4) comparison of each extracted electrophysiological and behavioral variable against the corresponding variable computed for a carefully constructed and statistically controlled age-regressed, normative database in which the variables have been transformed and confirmed for their Gaussian distribution.

[1]The analysis software is hardware independent and can read any EEG files recorded in ASCI, European data format (EDF), universal data format (UDF) and NeuroScan data format.

Questionnaires

Personal and clinical data –Questionnaire[2].

Questions	Descriptive Answers	Category
Name (family name, given name)		**General information**
Date of birth (Day/Month/Year)		
Gender (M-male, F-female)		
Handed (L- left, R – right)		
Diagnosis		
Reason of having QEEG assessment		
Medication taken now.[3].		
Source of referral		
Birth trauma and/or hypoxia		**Pre- and post-natal history**
Started to talk too late		
Head trauma (with loss of consciousness)		
Poor grades in school, poor performance at work		
Often having headaches and/or migraines.		**General Brain Regulation**
Feel weak and passive during daytime		
Sleep-related difficulties		
Abuse alcohol or drugs.		
Perceptual difficulties (paresis, dyslexia, Wernike aphasia, neglect…)		**Sensory system**
Autistic spectrum behavior		
Motor-related difficulties (akenesia, bradokinesia, tremor, rigidity, Broca aphasia…)		**Motor system**
Attention-related difficulties		**Executive system**
Impulsiveness		
Difficulties in correcting behavior		
Psychosis (hallucinations, delusions…)		
Occupied by mostly positive thoughts, manic		**Affective system**
Occupied by mostly negative emotions, depressed		
Anxious		
Poor memory for recent events		**Memory system**
Other forms of memory deficit		

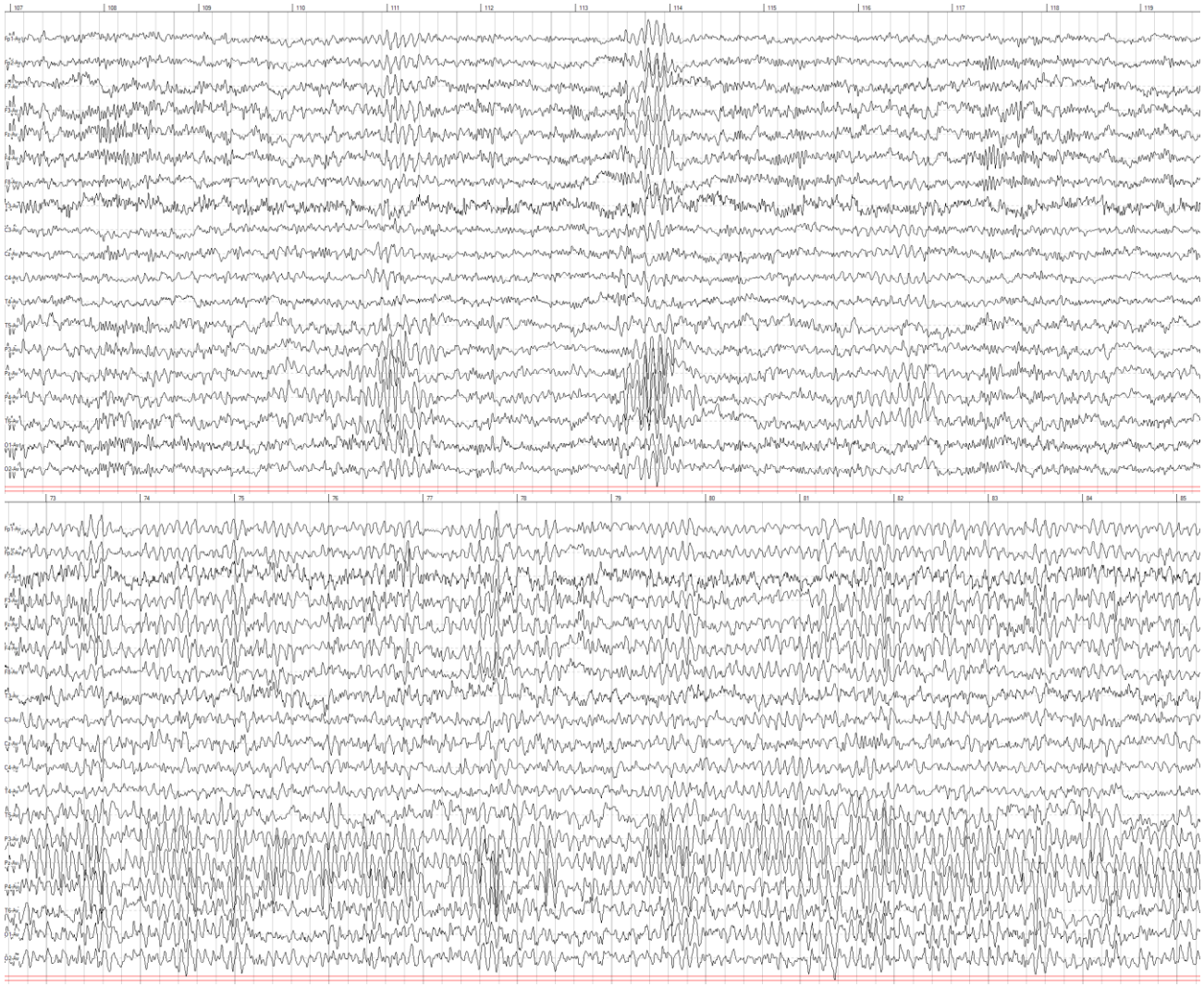
[2] Note that the questions above are not to make a medical diagnosis but to define the brain systems that might be impaired in association with the client's complaints. Thus, the goals of this Questionnaire are 1) focusing on specific problems of the client, 2) selecting a specific test for assessment and 3) eventually choosing the right protocol of neurotherapy or the right medication.

[3] Note that EEG parameters may be compared with the Normative data base if the patient is free of medication or drug for at least one day. Some medications may require more time to be washed out of the brain.

Spontaneous EEG

EEG was recorded during relaxation with closed eyes (5 minutes) and opened eyes (5 minutes). From this recording, spectral data was calculated and compared with database population. Database comparison was calculated with weighted montage. Speed – 30 mm/s; Gain - 50 μV; Low cut – 0.53 Hz; High cut – 50 Hz; Notch – 45-55 Hz.

Fragment Eyes open



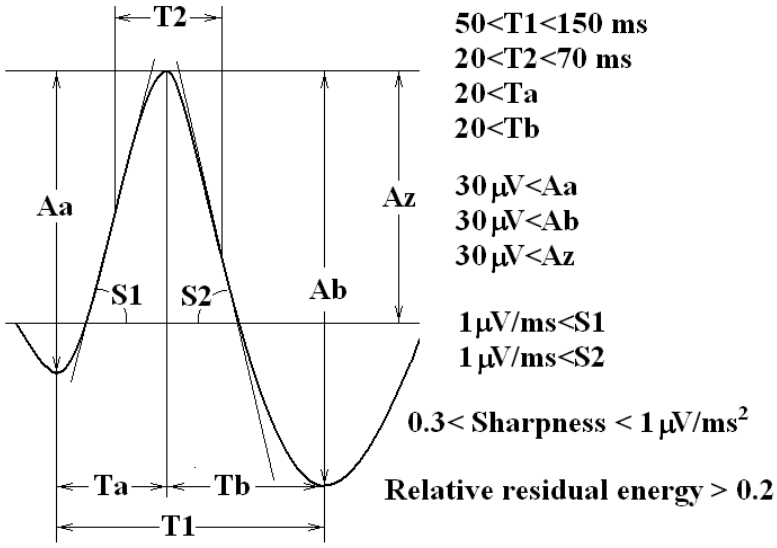
Spike Detection

Result of the visual EEG inspection

Dominant activity within delta1 and theta2 frequency range, EEG is poorly organized with normal amplitude from 30 to 60 μV. Moderate diffuse changes with signs of neurophysiological immaturity.

Search for paroxysms and pathological signs

The method of automated spike detection is based on temporal parameters of spikes as well on spatial location of the corresponding spike dipole[4]. The amplitude-temporal parameters have defined on the basis of comparison spike detection by the program and by experienced experts on the data base of more than 300 EEG recordings in epileptic patients. There are three characteristics that define a spike or a sharp wave in EEG. They are paroxysmal character, high degree of sharpness and short duration. These parameters are presented in Fig[5].



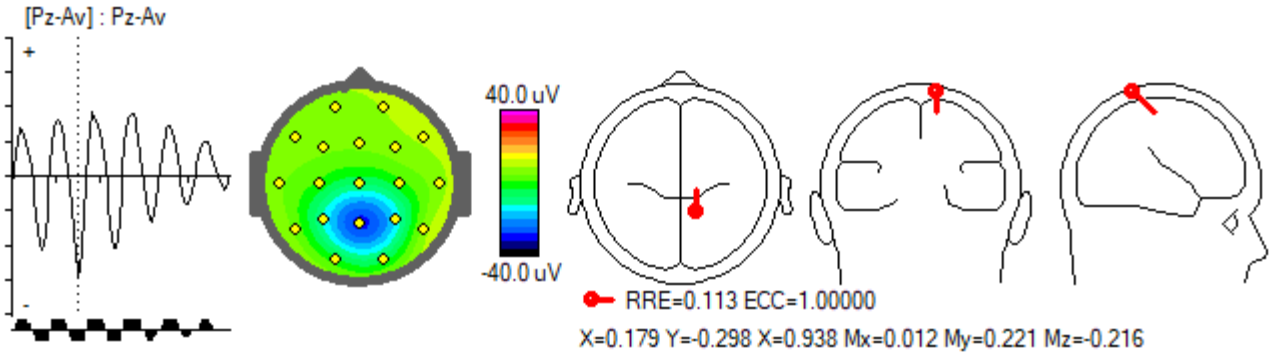
The relative residual energy for dipole approximation of the detected spike is chosen less than 0.2.

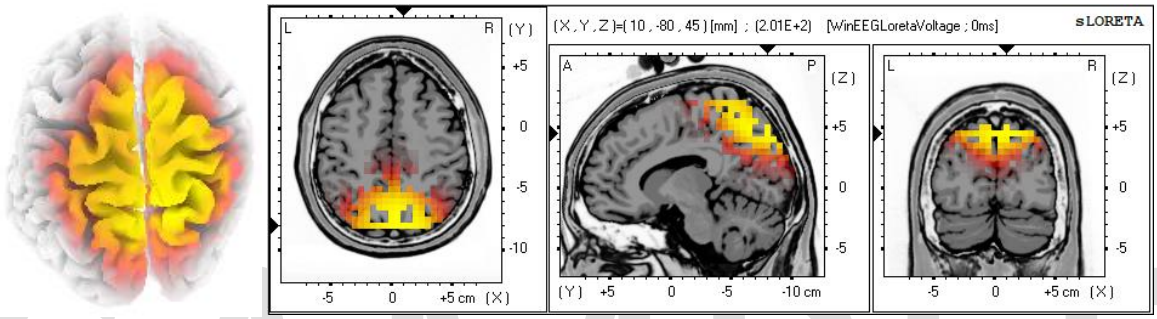
For this client the automatic spike detection was performed on EEG in the common average montage for both eyes open and eyes closed conditions.

Deviations identified in the form of focal, sharp waves at the parietal-temporal distribution TPds and maximum amplitude up to 100 mkV at Pz at the alpha frequency range – 10 to 13 Hz.

[4] P.Y. Ktonas Automated spike and sharp wave (SSW) detection. In Methods of analysis of brain electrical and Magnetic signals. EEG handbook (revised series, Vol 1) A.S. Gevins and A. Remond (Eds). 1987, Elsevier Science Publishers B.V. 211-241 pp

[5] The parameters are taken from the paper Ktonas P.Y. Automated spike and sharp wave (SSW) detection. In Methods of analysis of brain electrical and Magnetic signals. EEG handbook (revised series, Vol 1) A.S. Gevins and A. Remond (Eds). 1987, Elsevier Science Publishers B.V. 211-241 pp.)



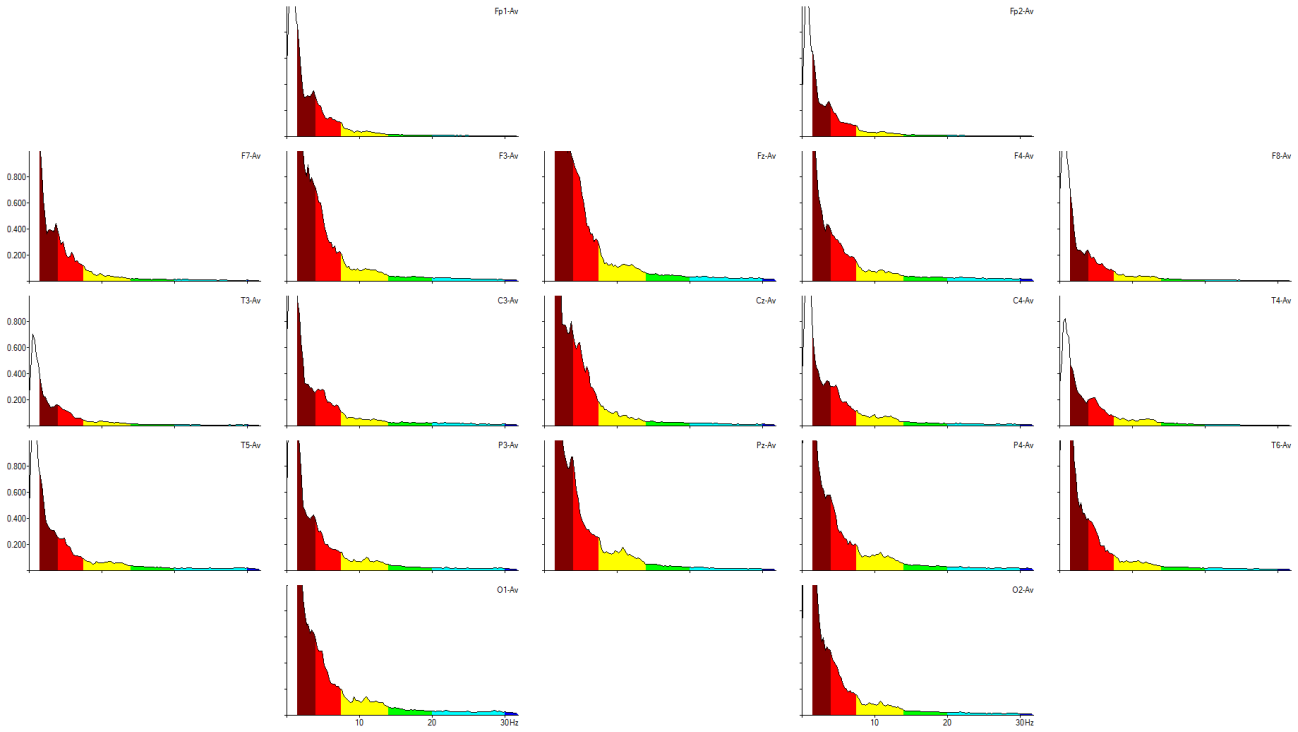


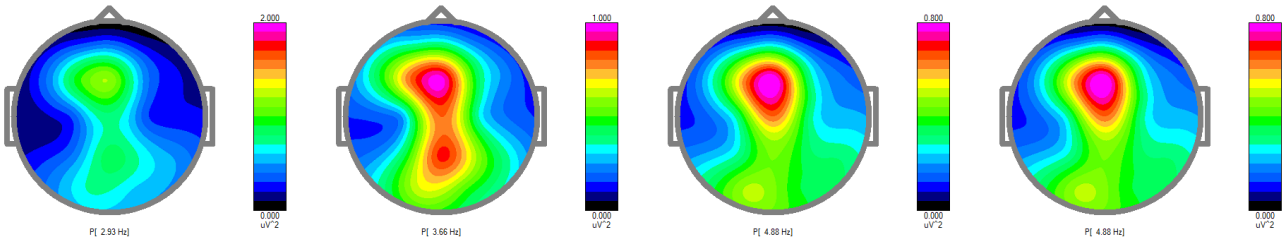
(X= 10, Y= -80 , Z= 45) (MNI coords) Best Match at 0 mm **Brodmann area 7 Precuneus Parietal Lobe**

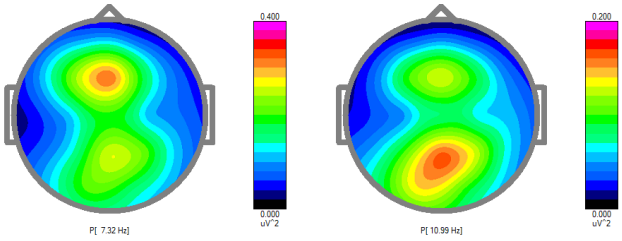
QEEG analysis

Spectral data: eyes opened

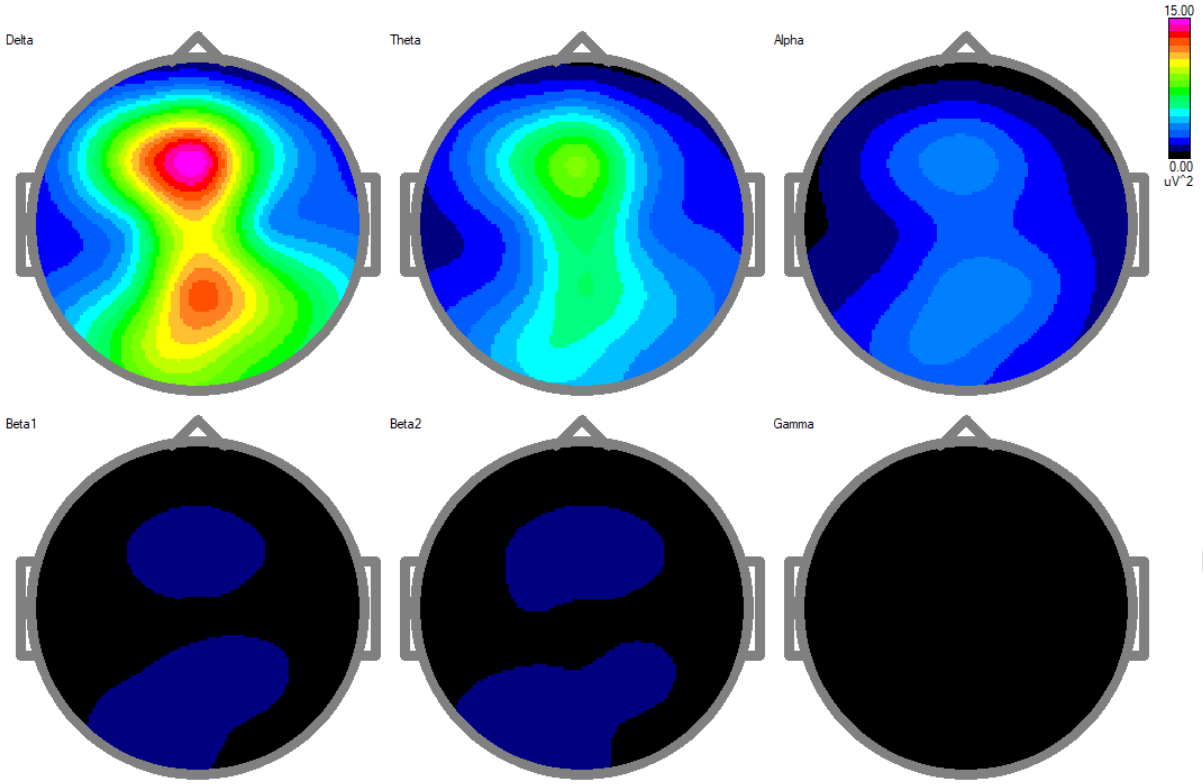
Graphs of EEG power spectra. Absolute spectra power (P)



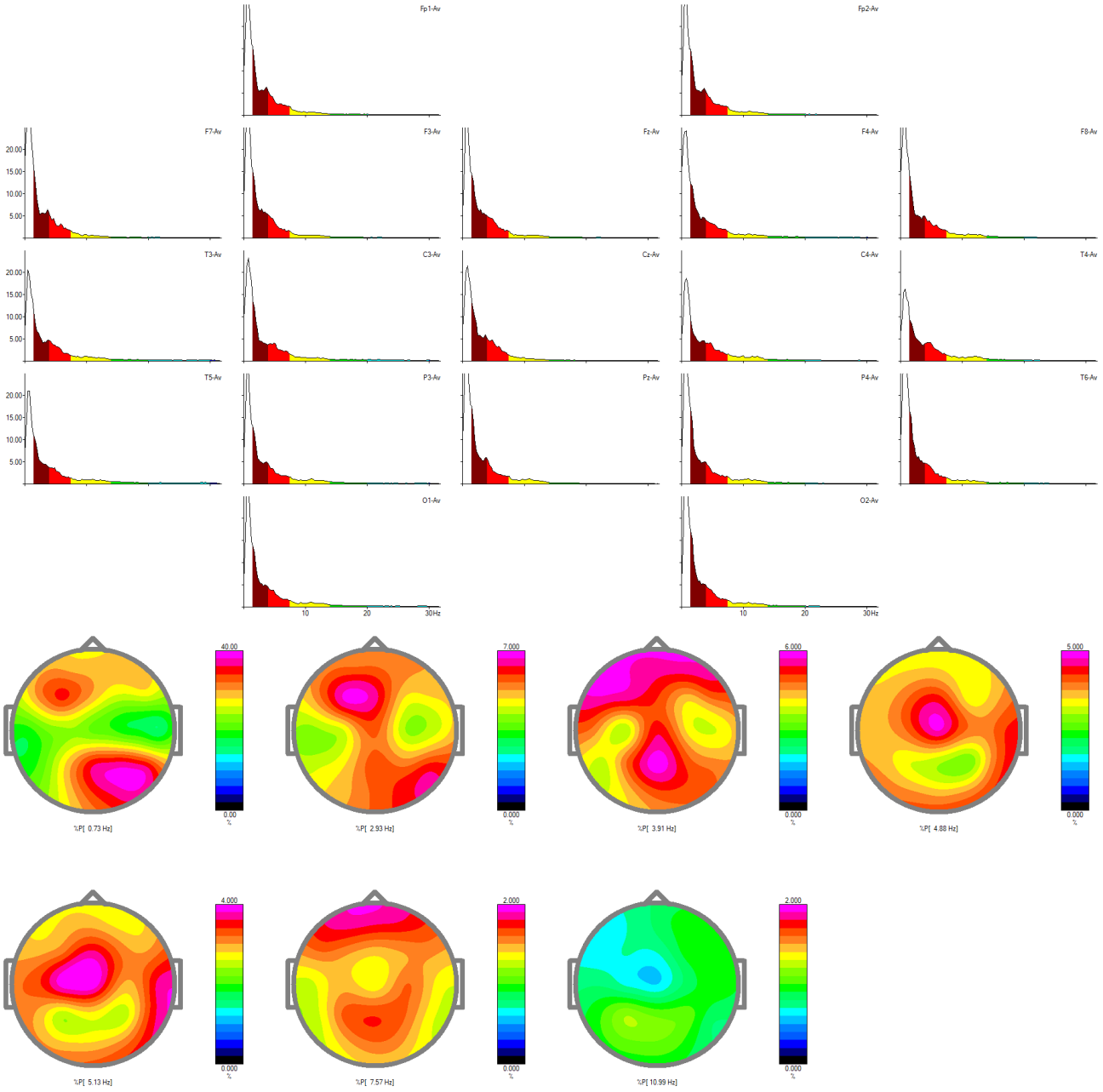




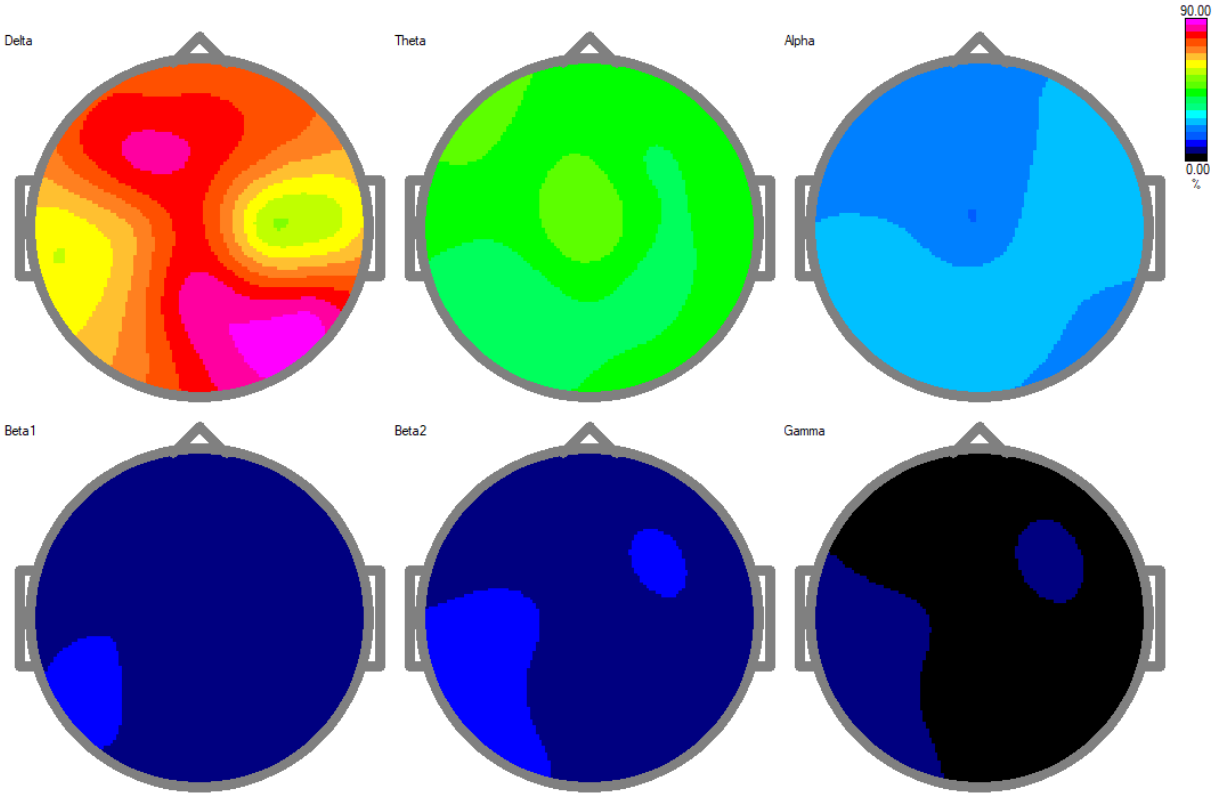
Graphs of EEG power spectra (maps). Absolute spectra power (P)



Graphs of EEG power spectra. Relative spectra power (%P)



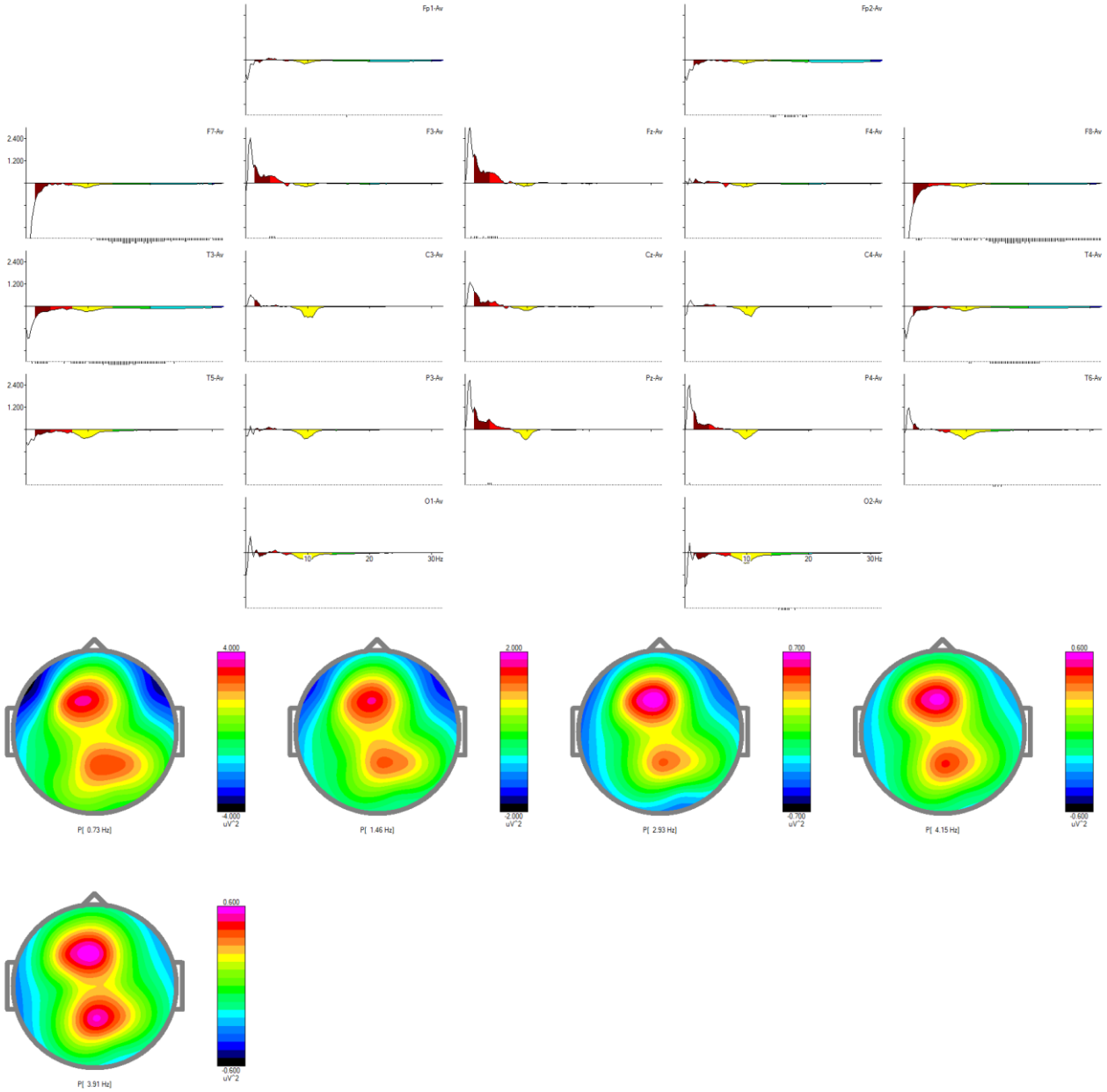
Graphs of EEG power spectra (maps). Relative spectra power (%P)



Comparison with the HBImed reference database

Graphs of EEG power spectra. Absolute spectra power (P)

Bars on the bottom line indicate significant deviations from norm with P Value <0.01 and Z Score > 2.5



Graphs of EEG power spectra. Relative spectra power (%P)

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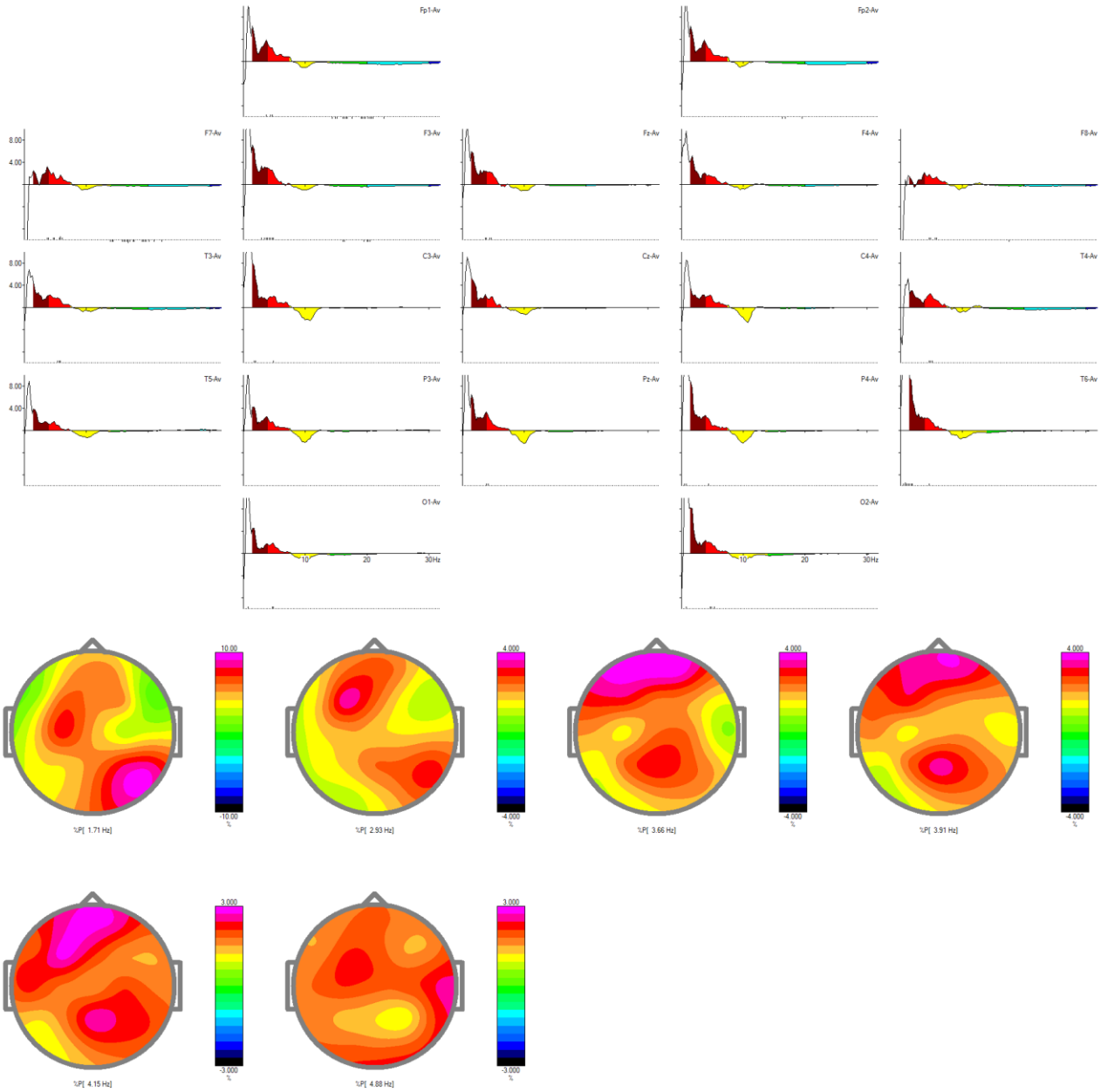


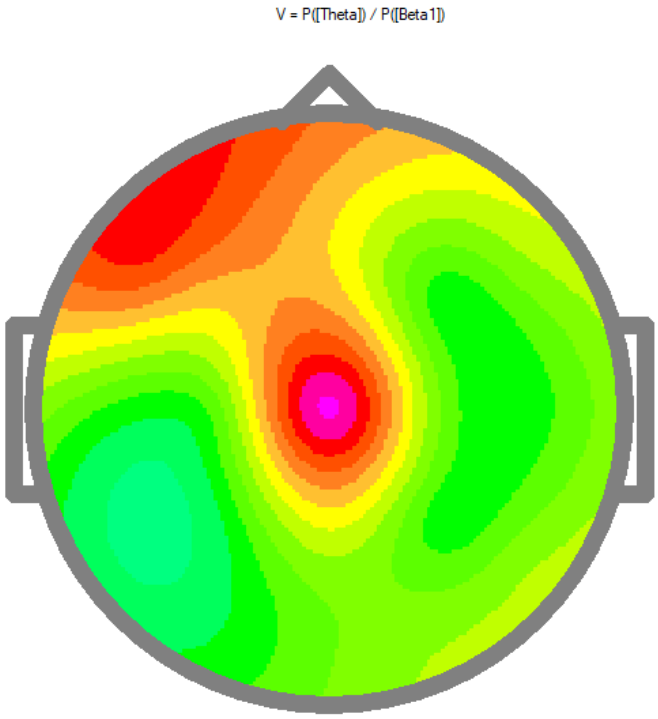
Increased level of the relative delta power spectra in the left central and in the right occipital-temporal areas.

Increased level of the theta power spectra in the orbital-frontal, frontal, temporal, right central, parietal and occipital areas.

Theta/Beta-Ratio

The Theta/Beta ratio gives an index as to the quality of an individual's ability to pay attention. This ratio is negatively correlated with age, as it is expected to be larger in younger children, smaller in adulthood and rises again in later adulthood. This is measured in a GO/NOGO Test where it is expected that a higher ratio will produce more errors. This ratio has been demonstrated in the research of Monastra (Monastra et. al., 1999).

Eyes open condition



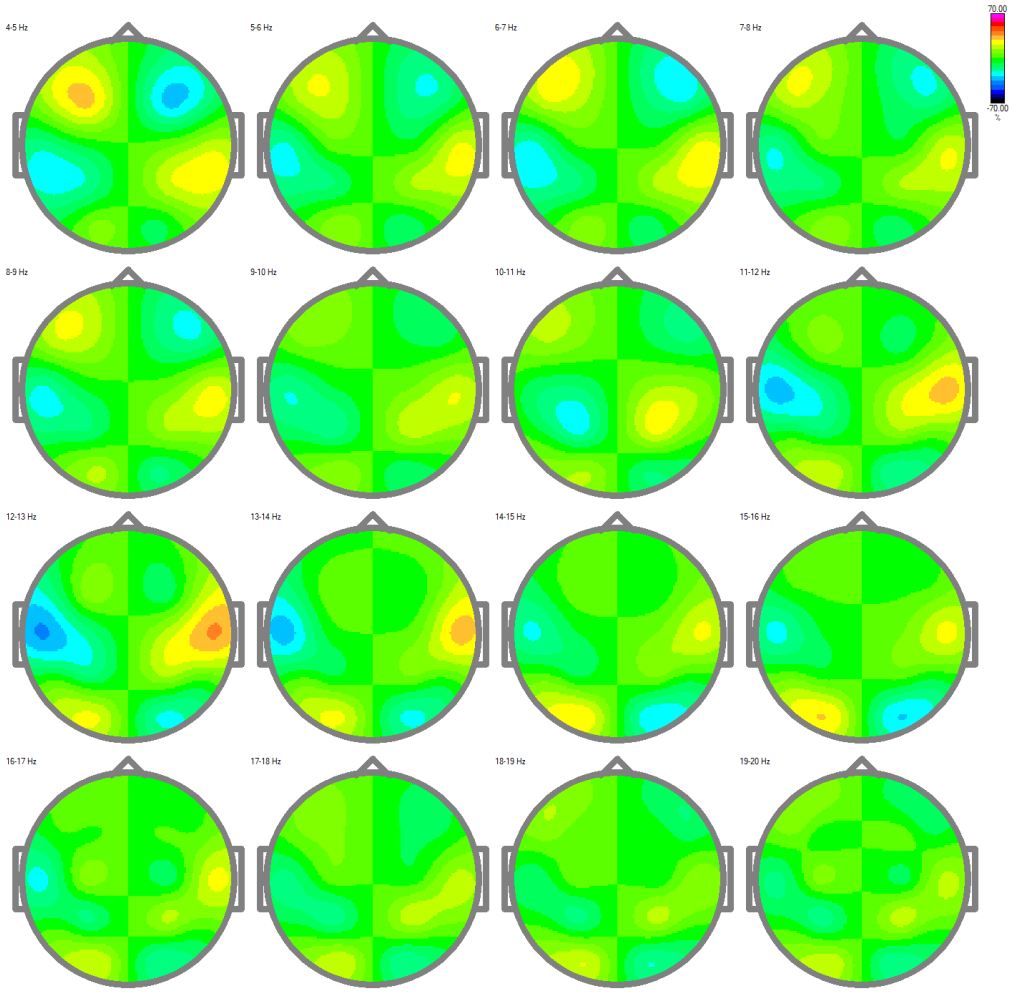
Index of inattention significantly increased = 10 (norm 2)

Monastra VJ, Lubar JF, Linden M, VanDeusen P, Green G, Wing W, Phillips A, Fenger TN. Assessing attention deficit hyperactivity disorder via quantitative electroencephalography: an initial validation study. Neuropsychology. 1999 Jul;13(3):424-433.

Asymmetry

Asymmetry more than 70% can be associated with neurological abnormalities. Asymmetry within frontal and temporal areas has been linked to symptoms of depression, negative affect, decreased memory performance and negative disposition symptoms. This was associated with selective cognitive deficit and somatic anxiety with vegetative symptoms of palpitation, panic attach and dizziness.

Asymmetry eyes open:

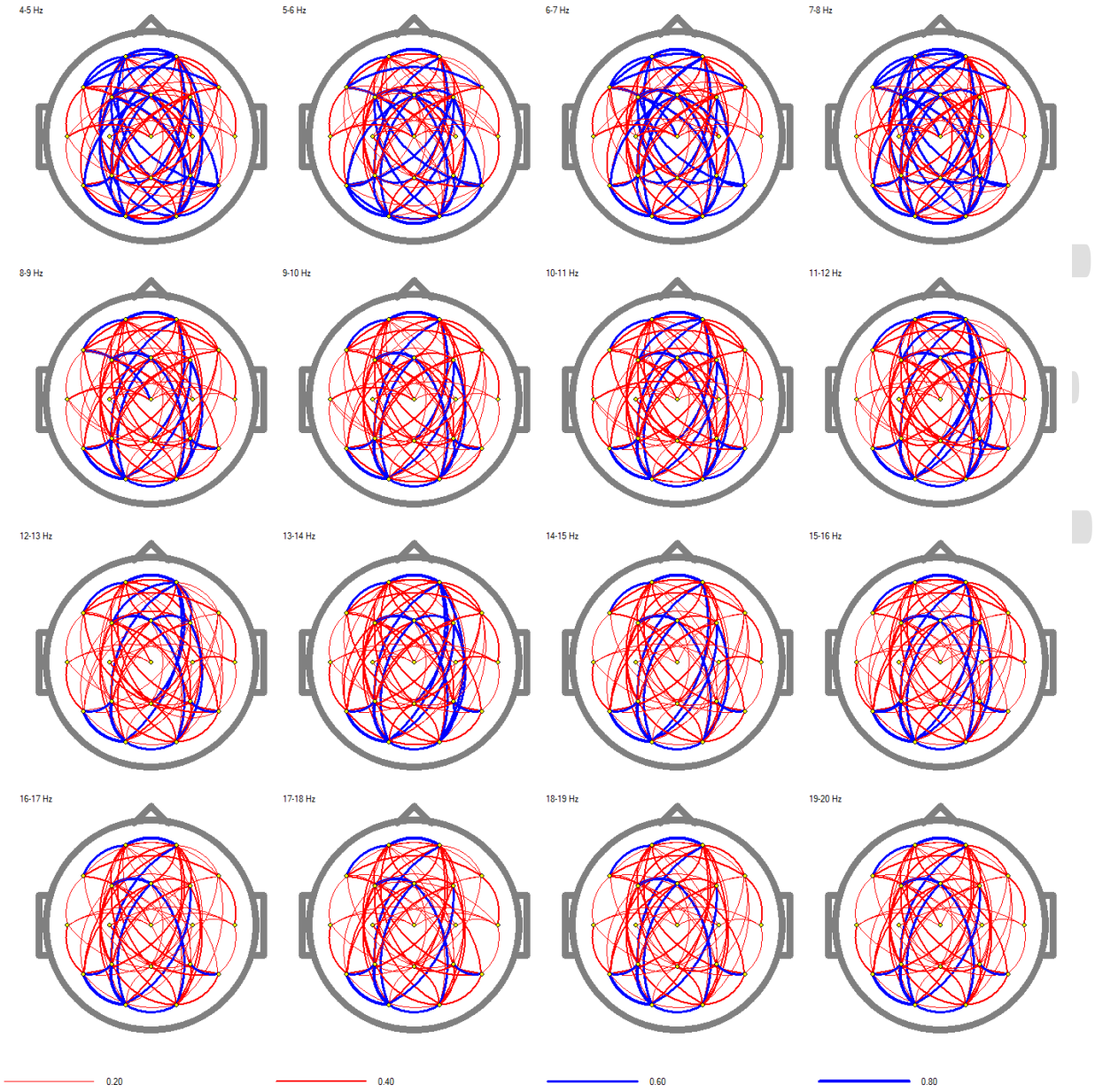


No significant asymmetry found in the eyes open condition.

Coherence

The coherence analysis is a measure of the relationship of various structures in the cortex. The coherence analysis provides a ratio of the correlation of a specific frequency range. Violet and red lines represent excessive positive correlations, light blue and dark blue lines represent excessive negative correlations. Excessive positive correlations suggest that there is over-communication between the sites. Excessive negative correlations suggest that there is a lack of communication between the sites.

Coherence in eyes open condition:



Decreased coherence in the orbital-frontal, frontal, frontal-parietal, parietal and occipital areas in the eyes opened condition.

VCPT (visual continuous performance task)
Performance in visual continuous performance task

Performance was recorded during the visual continuous performance task (VCPT). The measures can be interpreted regarding impulsivity (commission errors), attention (omission errors, missed trials), reaction times (msec) and variability of reaction times.

Subject responses – green, normative database – red, statistical comparison - blue

VCPT

Group name		Omisson	Comission	RT1	SE(RT1)
Statistical comparison	a-a GO [D]	p=0.670	0.00%	p=0.552	p=0.844
	a-p NoGO [D]	0.00%	p=0.709	0	0.0
Subject	a-a GO [1]	1.00%	0.00%	470	9.7
	a-p NoGO [1]	0.00%	0.00%	0	0.0
Normative database	a-a GO [2]	1.79%	0.00%	414	9.1
	a-p NoGO [2]	0.00%	0.47%	0	0.0

Number of processed trials: 400 (a-a GO: **100**, a-p NoGO: **100**, p-p: 100, p-h: **100**)

Overview: performance within normal range.

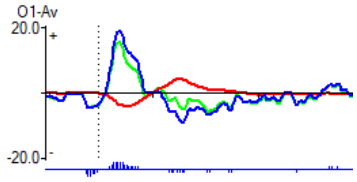
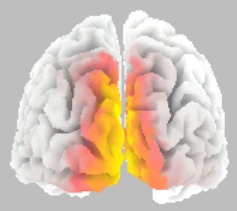
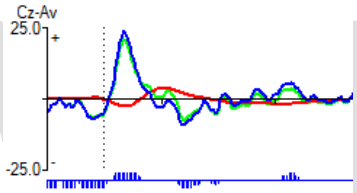
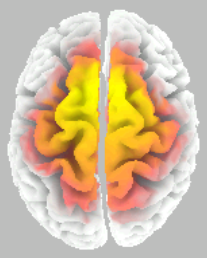
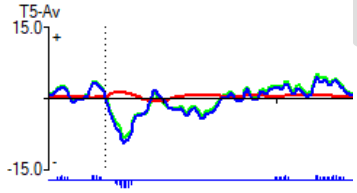
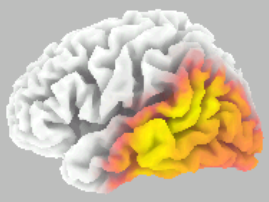
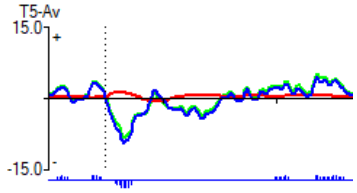
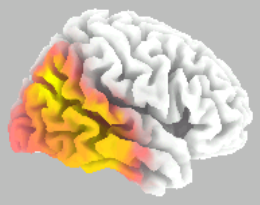
Evoked Potentials in VCPT

The images of the evoked potentials are relevant to information processing in different regions of the brain during the presentation of simple stimuli. In the various potentials, only specific neuronal groups and networks are involved.

Comparison of the components with database:

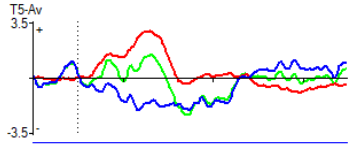
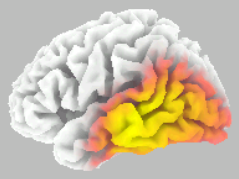
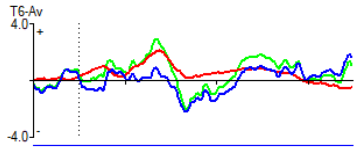
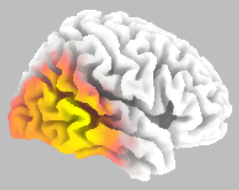
Input areas:

green: client/red: database/blue: difference (significance)

P1N1 Visual Input		*Brodmann area 19* *Cuneus* *Occipital Lobe* *Best Match at 5mm* *Brodmann area 18* *Cuneus* *Occipital Lobe*	
N1P2 Auditory Novelty		*Brodmann area 6* *Superior Frontal Gyrus* *Frontal Lobe* *Best Match at 17mm* *Brodmann area 8* *Superior Frontal Gyrus* *Frontal Lobe*	
P1N1 vTL left Association areas		*Brodmann area 22* *Superior Temporal Gyrus* *Temporal Lobe* *Best Match at 7mm* *Brodmann area 40* *Supremargial Gyrus* *Temporal Lobe*	
P1N1 vTR right Association areas		*Brodmann area 39* *Angular Gyrus* *Parietal Lobe* *Best Match at 9mm* *Brodmann area 40* *Inferior Parietal Lobule* *Parietal Lobe*	

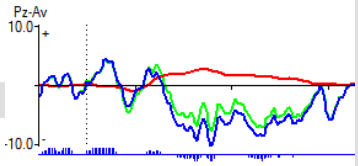
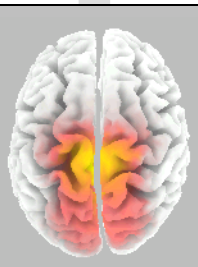
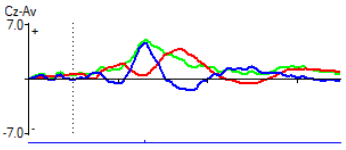
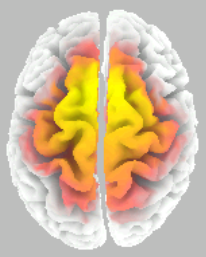
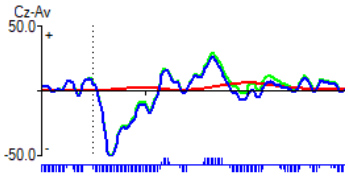
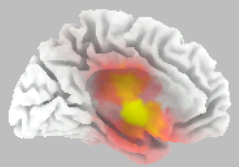
Memory areas:

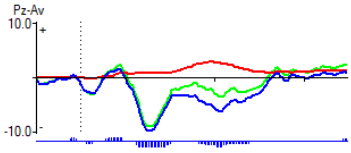
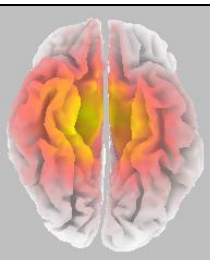
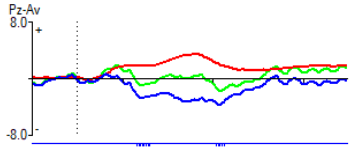
green: client/red: database/blue: difference (significance)

V com TL left Memory areas		*Brodmann area 21* *Middle Temporal Gyrus* *Temporal Lobe* *Best Match at 7mm* *Brodmann area 22* *Middle Temporal Gyrus* *Temporal Lobe*	
V com TR right Memory areas		*Brodmann area 21* *Middle Temporal Gyrus* *Temporal Lobe* *Best Match at 5mm* *Middle Temporal Gyrus* *Temporal Lobe*	

Executive function areas:

green: client/red: database/blue: difference (significance)

P3b Engagement		*Brodmann area 6* *Medial Frontal Gyrus* *Frontal Lobe* *Best Match at 5mm* *Brodmann area 5* *Paracentral Lobule* *Frontal Lobe*	
P3a Inhibition/Suppression		*Brodmann area 6* *Superior Frontal Gyrus* *Frontal Lobe* *Best Match at 17mm* *Brodmann area 8* *Superior Frontal Gyrus* *Frontal Lobe*	
P4 monCC Monitoring		*Brodmann area 25* *Anterior Cingulate* *Limbic Lobe* *Best Match at 15mm* *Brodmann area 34* *Subcallosal Gyrus* *Frontal Lobe*	

P4wmF Working Memory		*Brodmann area 34* *Parahippocampus Gyrus* *Limbic Lobe* *Best Match at 5 mm* *Brodmann area 28* *Parahippocampal Gyrus* *Limbic Lobe* 
SW PHC Slow Wave Activity This component reflects a part of limbic system activity		*Brodmann area 28* *Parahippocampal Gyrus* *Limbic Lobe* *Best Match at 5 mm* *Brodmann area 34* *Parahippocampal Gyrus* *Limbic Lobe*