



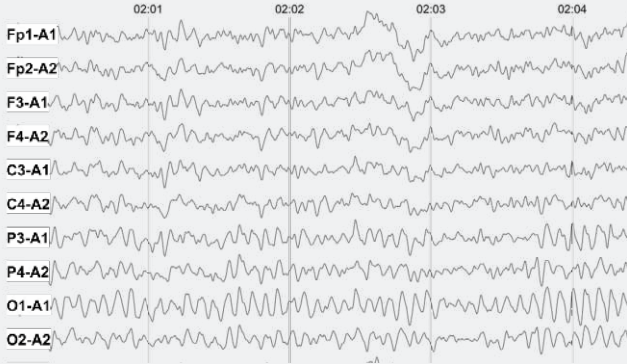
qEEG

for psychiatry and psychology

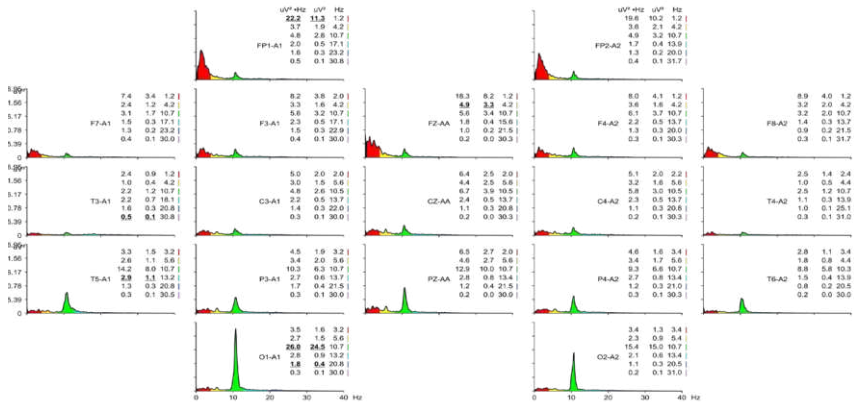
Quantitative electroencephalography (qEEG) is mathematical transformation EEG waves into frequency-time field and search specific markers of brain and mental status.

- measure of personal brain activity
- markers for cognitive and psychiatry problem detection
- markers for individual biofeedback program
- markers for differential classification according ICD-10 F01–F09

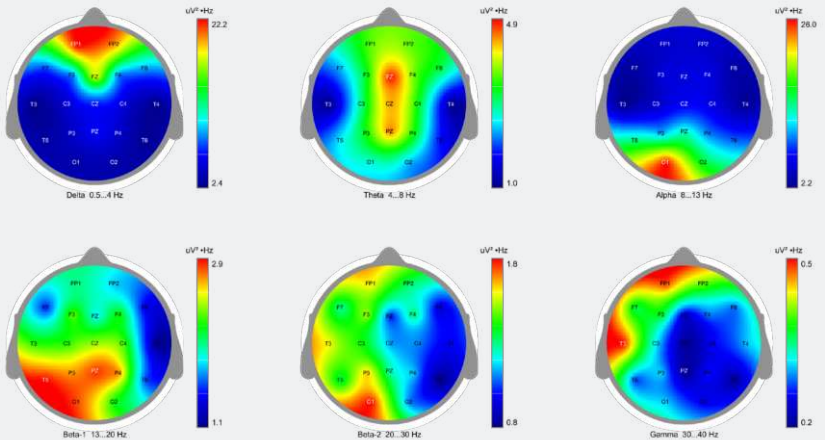
Native EEG



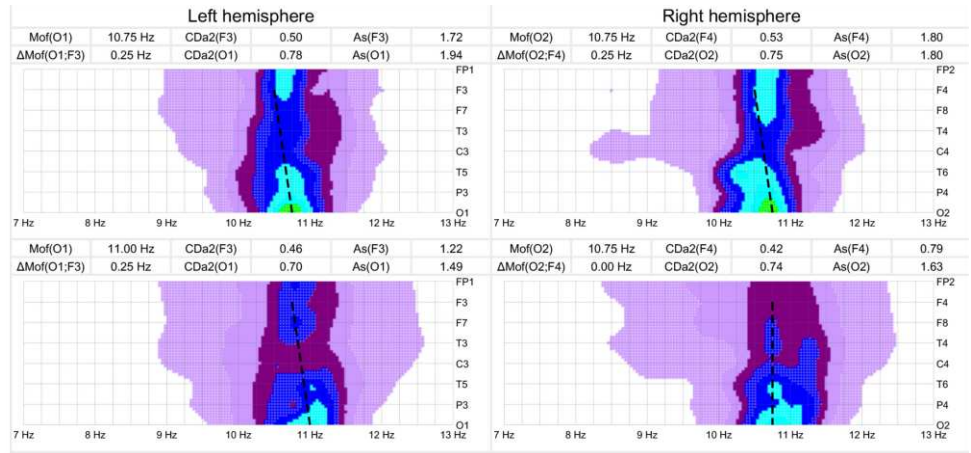
Spectras by electrodes



Maps by frequency bands



DAFCAR



DAFCAR compares the deviation of the alpha-rhythm spectrum from the normal distribution and assessment of mental health on base analyze of two values: Neurophysiological Cognitive Level and Neurophysiological Stressresistance Level. Used 6 min test with hyperventilation stage.



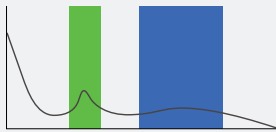
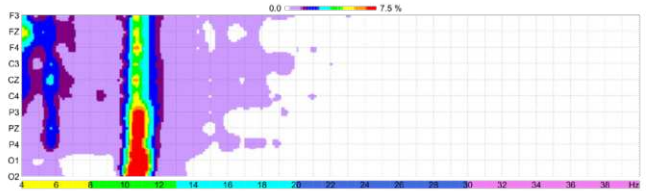
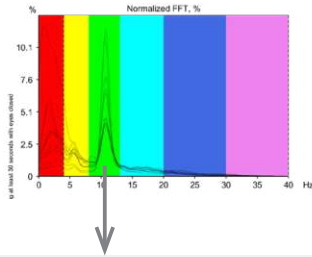
Atlas of EEG alpha rhythm cartograms for diagnosing mental disorders according to ICD-10 F01–F09. This is statistical analysis of 14,000 EEGs obtained during psychiatric examination.

Neurophysiological cognitive level (NCL)	Neurophysiological stressresistance level (NSL)			
	Norm	Slight decrease	Moderate decrease	Significant decrease
Critical decrease	Significant deviation	Significant deviation	Significant deviation	Significant deviation
Significant decrease	Significant deviation	Significant deviation	Significant deviation	Significant deviation
Moderate decrease	Moderate deviation	Moderate deviation	Moderate deviation	Endogenous psychopathology
Slight decrease	Mild deviation	Moderate deviation	Moderate deviation	Endogenous psychopathology
Norm	Mentally healthy	Mild deviation	Moderate deviation	Endogenous psychopathology
Above norm	Mentally healthy	Mentally healthy	Mild deviation	Endogenous psychopathology

Spectral categories

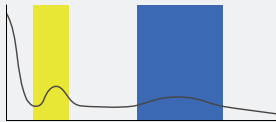
Pre-defined spectral EEG patterns are an indicator of functional reservation (severity of thalamocortical deafferentation).

It can be used to predict brain recovery after severe brain injuries.



Full integrity (alpha 8–12 Hz and beta 15–40 Hz)

Normal tonic firing of the thalamus and normal resting cortical oscillations.



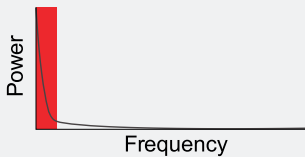
Thalamo-cortical dysrhythmia (co-localized theta 5-7 Hz and beta 15–40 Hz)

Deafferented thalamus fires in burst mode and the afferent volley of synaptic activity is received by relatively intact neocortical regions.



Severe deafferentation (theta 5-7 Hz)

Severe structural brain injuries of varying etiologies.



Complete functional deafferentation (delta <4 Hz)

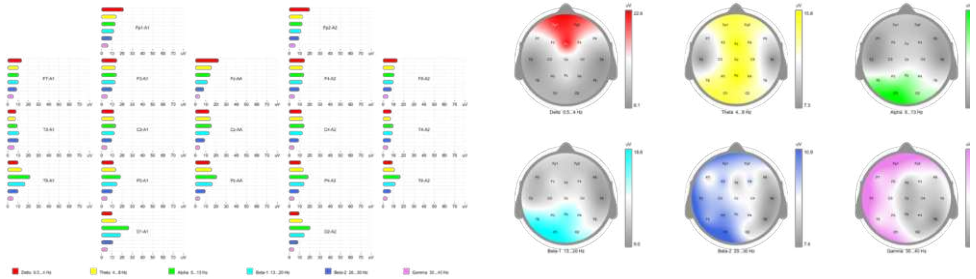
Negative prognosis for brain recovery.

Forgacs PB, Frey HP, Velazquez A, Thompson S, Brodie D, Moitra V, Rabani L, Park S, Agarwal S, Falo MC, Schiff ND, Claassen J. Dynamic regimes of neocortical activity linked to corticothalamic integrity correlate with outcomes in acute anoxic brain injury after cardiac arrest. *Ann Clin Transl Neurol.* 2017 Jan 6; 4(2):119-129. doi: 10.1002/acn3.385. PMID: 28168211; PMCID: PMC5288467.

Eldow BL, Claassen J, Schiff ND, Greer DM. Recovery from disorders of consciousness: mechanisms, prognosis and emerging therapies. *Nat Rev Neurol.* 2021 Mar; 17(3):135-156. doi: 10.1038/s41582-020-00428-x. Epub 2020 Dec 14. PMID: 33318675; PMCID: PMC7734616.

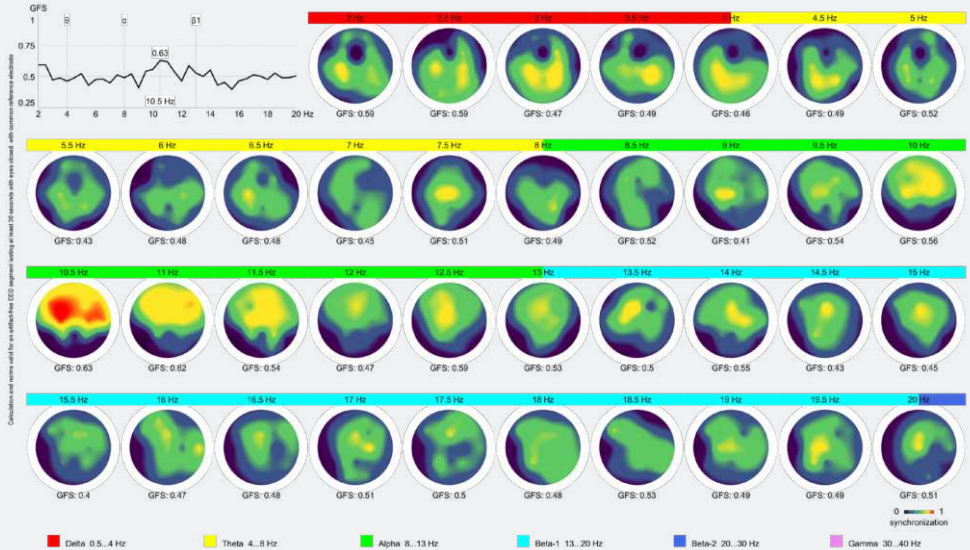
Average amplitude analysis

Average amplitude values for each of the EEG ranges and their spatial distribution.



Global Field Synchronization

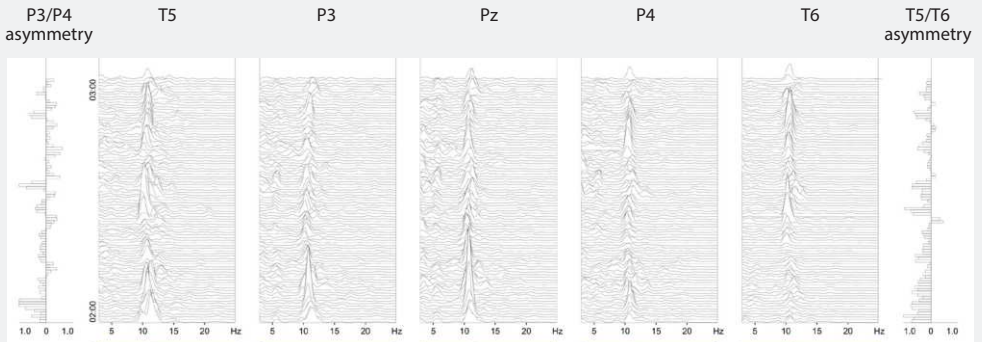
An indicator of spatial connectivity of brain processes by coherence of EEG oscillation phases for all leads.



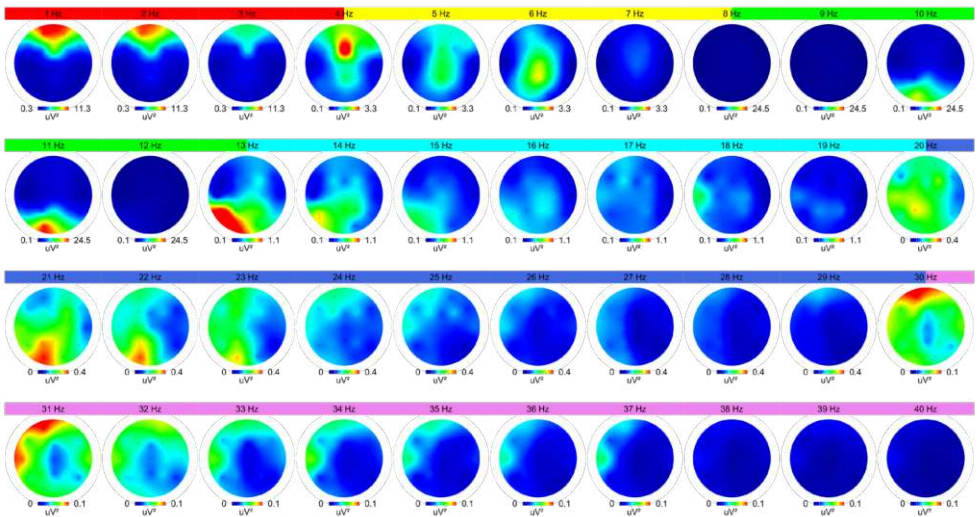
Koenig T, Lehmann D, Saito N, Kuginuki T, Kinoshita T, Koukoku M. Decreased functional connectivity of EEG theta-frequency activity in first-episode, neuroleptic-naïve patients with schizophrenia: preliminary results. *Schizophr Res*. 2001 May 30; 50(1-2):55-60. doi: 10.1016/s0920-9964(00)00154-7. PMID: 11378314.

Brain symmetry index

Pairwise derived brain symmetry evaluates asymmetry along homologous channel pairs for the EEG spectrum power in the range from 1 to 30 Hz. Severe EEG asymmetry indicates organic brain injuries.



FFT power distribution



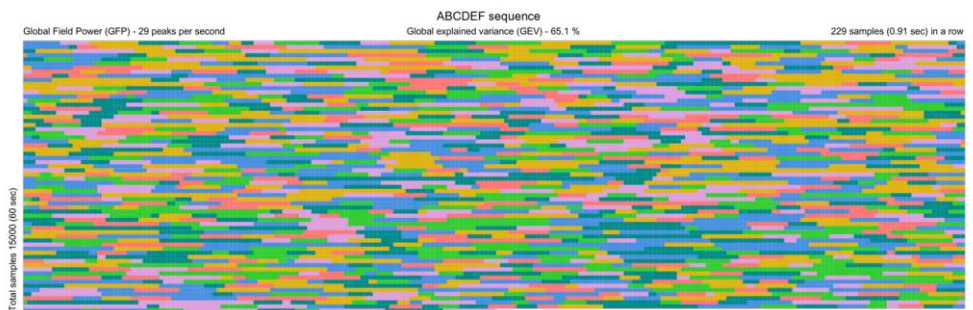
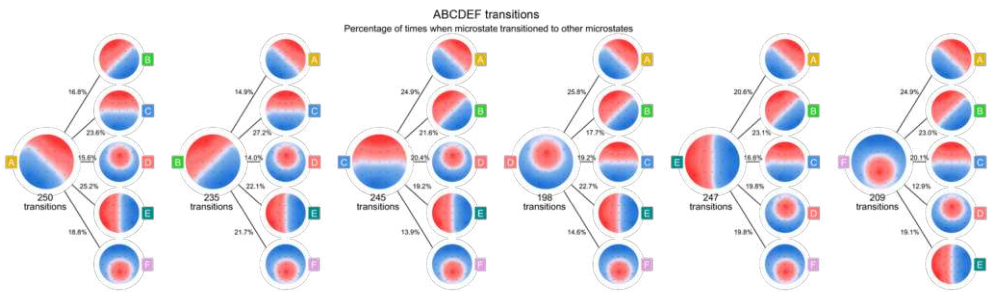
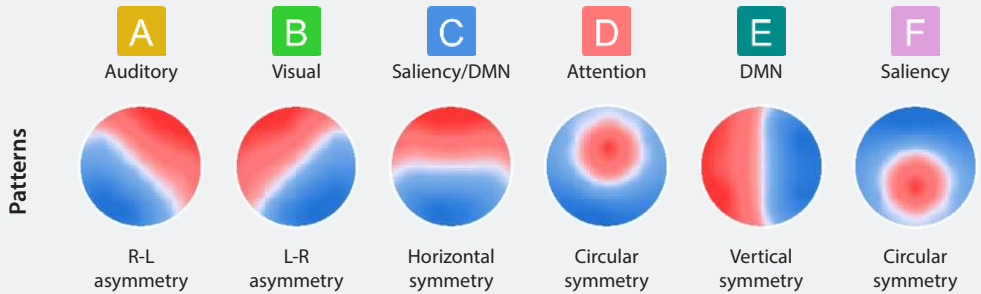
R.V.A. Sheorajpanday et al. Additional value of quantitative EEG in acute anterior circulation syndrome of presumed ischemic origin / Clinical Neurophysiology 121 (2010) 1719–1725, doi:10.1016/j.clinph.2009.10.037.

Bentes C. et al. Quantitative EEG and functional outcome following acute ischemic stroke, Clinical Neurophysiology, V. 129, Issue 8, 2018, P. 1680-1687, ISSN 1388-2457, <https://doi.org/10.1016/j.clinph.2018.05.021>

Finnigan S. et al. Defining abnormal slow EEG activity in acute ischaemic stroke: Delta/alpha ratio as an optimal QEEGindex. Clin Neurophysiol (2015), <http://dx.doi.org/10.1016/j.clinph.2015.07.014>

Microstates

Statistical analysis of transient, quasi-stable states of EEG – 4 or 6 brain activity patterns.



Baldini S et al. Microstates in multiple sclerosis: an electrophysiological signature of altered large-scale networks functioning?, *Brain Communications*, V 5, Issue 1, 2023, fcac255, <https://doi.org/10.1093/braincomms/fcac255>

Kleinert, T., Nash, K., Koenig, T. et al. Normative Intercorrelations Between EEG Microstate Characteristics. *Brain Topogr* 37, 265-269 (2024). <https://doi.org/10.1007/s10548-023-00988-3>

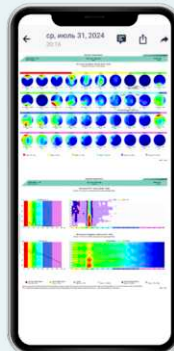
Musaeus CS, Engedal K, Høgh P, et al. Changes in the left temporal microstate are a sign of cognitive decline in patients with Alzheimer's disease. *BrainBehav.* 2020;10:e01630. <https://doi.org/10.1002/brb3.1630>

Devices

NeoRec21 or NeoRec21 mini for mobile qEEG with cloud database.



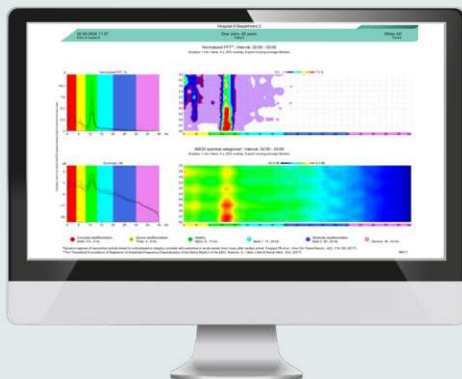
NEUROvisor mobile iOS and Android apps are ready for smartphone or tablets. Routine EEG possible too. Really, it's a lab in your pocket.



NVX24, NVX36 or NVX52 for stationary qEEG on Windows PC and standalone software.



A stationary solution for clinics with the possibility of expansion as routine EEG, evoked potentials, Event-Related potentials, biomedical research.



Specifications of devices in the
Neurophysiology catalog

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