

## **Variability of the neurophysiological signals and its diagnostic meaning**

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The variability of the neurophysiological signals is a very important issue in the diagnosis of central as well as peripheral nervous system. In advanced neurophysiological examinations the stimulation procedures are applied and the variability of the evoked activity is evaluated using signal processing methods. Using our own method for the evaluation of the signal similarity we have found changes that were not able to be detected using other methods i.e. before and after seizure episode, before and after opening and closing eyes and also during stimulation before and after each stimulus. The new area where the analysis of variability of neurophysiological signals may be of very significance is in the simultaneous studies of the brain function and electrical activity i.e. functional magnetic resonance (fMRI) and electroencephalography (EEG). The principle of this method is to identify the changes of the blood flow and electrical activity in various brain structures during given task. EEG and fMRI methods have different time and spatial resolutions. In fMRI time resolution is comparable with the heart rate i.e. in range of seconds whereas time resolution of EEG mapping may be 1 ms or even better. Analysis of signal dynamics in fMRI and EEG studies provides new diagnostic possibilities and area of scientific research in neurophysiology.