Tomographic Quantitative EEG Analysis (qEEGT)

The system performs quantitative electroencephalogram (EEG) analysis (qEEG) in the frequency domain in order to estimate spectral activity at the electrodes (topography) as well as at the sources (tomography).

The traditional Broad Band Spectral Model (which defines a small number of broad bands to summarize the spectral activity of the EEG) is included. The user has the option to select the number as well as the frequency range limits for each band. The system also includes the more attractive and informative Narrow Band Spectral Model, which gives the possibility of analyzing the spectra of the EEG at each frequency.

One of the most significant feature available in qEEGT is the comparison with a normative database for obtaining a Z transformation correlated with age in the range 5-90 years. These norms are available for the 10/20 system.

With the calculation screen it is possible to set the parameters for calculating the different qEEGT models: Narrow Band, Broad Band and Electrical Tomography with or without Z transformation. It is possible also to select the physiological state as well as the montage to use for calculating.

qEEGT is calculated according to a new method for 3D tomography in the frequency domain: a variant of statistical parametric mapping for source log spectra. In the new tomographic method sources are estimated by means of a discrete spline EEG inverse solution known as Variable Resolution Electromagnetic Tomography (VARETA). Anatomical constraints are incorporated by the use of the Montreal Neurological Institute (MNI) probabilistic brain atlas. Efficient methods were developed for frequency domain VARETA in order to estimate the source spectra for the set of 103 – 105 voxels that comprise a EEG/MEG inverse solution. High resolution source Z spectra are then defined with respect to the age dependent mean and standard deviations of each voxel, which are summarized as regression equations calculated from the EEG normative database. The system offers two electrical tomography variants: computed only for brain cortex and brain cortex plus basal ganglia.

Deviations from normality are shown both as Z values and by superimposing the actual activity of the subject/patient with the mean and standard deviations obtained from the equation regressions of the normative database as shown in the figure. Together with the spectra the electrical tomography corresponding to the current frequency is shown to the right side in low resolution. BET Viewer system can be used to inspect in full detail and high resolution the electrical tomograpy calculated.

Broad Band measures are represented by means of topographic maps. In qEEGT topographic maps can e visualized with 5 different views and the color palette can be changed and edited as well as the scale type in order to improve maps interpretation

Movie generation is available at the Narrow Band screen. Movies are saved in standard Windows AVI format allowing further playing on any movie player.

Another new feature in qEEGT is the correction by means of the Geometric Power factor. This factor allows to eliminate scale differences among EEG data from different subjects due to system differences making them more comparable.

qEEGT system accepts EEG data from native format as well as Neuroscan formats (CNT and EEG) and ASCII format (according to some predefined structure) making the system very easy to use EEG recorded from different EEG devices. Follow-up studies can be visualized and compared in another screen making comparisons among different subjects possible.

Fuente: http://www.neuronicsa.com/modulos/producto/neuroimagenes.htm