Abstract View

DYNAMICS OF EVENT-RELATED COHERENCE BETWEEN INDEPENDENT COMPONENTS OF THE HUMAN EEG.

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We demonstrate that event-related coherence in the human EEG, computed using a short-time Fourier wavelet decomposition, shows multiple synchronization frequencies with abrupt event-related jumps in coherence frequency and, less frequently, in synchronization lag. Previous studies of EEG coherence have suffered from confounds arising from the large projection areas for all but the most superficial brain generator configurations. Since projections from different generators overlap widely, single scalp electrode channels typically pick up and sum activity from a relatively large number of discrete EEG sources. Changes in coherence between two scalp electrode channels thus may reflect any of several types of changes in the summed mixtures of activities they record. Computing coherence between independent components (ICs) of the EEG, derived using the infomax ICA algorithm, increases the functional specificity of the derived results. Study of event-related coherence between ICs suggests that cooperativity between brain networks may be accomplished through joint oscillatory processes operating at multiple discrete (theta to gamma) frequencies, only some of which may appear as peaks in the EEG power spectra, and these oscillatory linkages may be transiently created, broken or transformed by experimental events.
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