生物物理学报(2005) 21(1), 39-45

PDF文档

脑电事件相关去同步化和同步化的神经元群模型

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为了研究被试者在某种认知状态下脑功能区的连接状态，本文建立了丘脑-皮质网络的神经元群模型，模型包括三个模块，分别对应脑电头皮电极C3,Cz,C4记录的三个皮质区；输入调制信号模拟想象左右手移动的状态。仿真输出信号的alpha频带功率谱出现了事件相关电位去同步化和同步化现象，与实际脑机接口实验结果一致，然后对模型进行线性和非线性分析。研究结果表明：功能相近的区域间有更强的耦合；随着耦合强度的增加，输出信号间的相关性和同步性均增加。

A neuron population model for event-related desynchronization and synchronization

To understand the brain connectivity with certain mental tasks, the paper set up a neuron population model of thalamo-cortical network. It consists of three modules corresponding to cortex regions under EEG electrodes C3,Cz and C4. Its modulating input simulates the state of left and right hand movement imagination. The alpha frequency band spectrum of output shows event-related desynchronization and synchronization (ERD and ERS), which is consistent with the brain computer interface experiment. Then the model is analyzed with linear and nonlinear measurements. The results suggest that the similar functional regions have more inhibitory connection and the dependency between the time series increase with coupling strength.

关键词