

論文の内容の要旨

A Neural Field Model at Criticality (臨界点における神経場モデル)

名前 テームサイトン ティーラシット

A neural field model is used to simulate spatio-temporal evolution of spontaneous neural activity in the critical regime, a domain where a system's control parameter is in the vicinity of a critical point. The critical point is the point where the system passes through the second-order phase transition. This point possesses some special properties, such as power-law or scale-free behaviors and divergence of correlation lengths. In this research, certain properties of the model in the critical regime and outside are determined. For example, correlation patterns, community structure of functional networks, coherence patterns, and phase shift and phase lock durations are studied in the neural system at criticality in comparison with other regions, namely, the supercritical and subcritical regions. Our study shows that many aspects of the brain information processing are optimized in the critical region. In addition, we also observe some phenomena that have been found in empirical experiments the brain.