生物物理学报(2005) 21(6), 449-456

PDF文档

时滞援助的两抑制性突触耦合的Chay 神经元的同步

王青云*[1,2]、陆启韶[1]
1 北京航空航天大学理学院
2 财经学院

本文研究了一对抑制性突触耦合的混沌Chay 神经元的同步。研究发现当耦合强度超过临界值时，两抑制耦合的混沌Chay 神经元能达到反相的同步。于此同时，两混沌的神经元变为周期而不是原来的混沌运动。然而，如果我们考虑传导时滞，在有效的时滞下，两个耦合神经元的在相簇同步能增加。在相簇同步窗口的大小随着耦合强度的增加而增加。此结果对于我们理解神经元集群的运动是一个指导。

Conduction delay-aided synchronization in two inhibitorily synaptic coupled Chay neurons

We consider synchronization in a pair of chaotic Chay neurons coupled by synaptically mutual inhibition in this paper. It is shown that two coupled chaotic neurons with simple inhibition can synchronize out of phase when the coupling strength is above a certain critical value. At the same time, two chaotic neurons become a periodic bursting motion instead of the original chaotic one. However, with the conduction delay being considered, in-phase bursting synchronization of two neurons can be enhanced under an efficient conduction delay. The size of windows, in which, bursting synchronization is enhanced, increases with the coupling strength Hsyn. This result may be a guideline for us to understand collective motions in a group of neurons.

关键词

抑制性耦合神经元,反相同步, 簇同步(inhibitorily synaptic coupled neurons, out of phase synchronization, bursting synchronization)