

Synchronized Firing in Coupled Inhomogeneous Excitable Neurons

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Abstract: We study the firing synchronization behavior of the inhomogeneous excitable media. Phase synchronization of neuron firings is observed with increasing the coupling, while the phases of neurons are different (out-of-phase synchronization). We found the synchronization of bursts can be greatly enhanced by applying an external forcing (in-phase synchronization). The external forcing can be either a periodic or just homogeneous thermal noise. The mechanism responsible for this enhancement is discussed.

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Key words: excitable media, phase synchronization, FitzHugh-Nagumo model

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