Noise-induced transitions in neuronal system

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ABSTRACT

Noise present in neuronal system leads to trial-to-trial variability in the neural response and triggers transitions between neuronal states. Previously, I analyzed noise-induced transitions in slow-wave neuronal dynamics having relaxation character [1]. Here, I extend analysis to relaxation dynamics having limit cycles. Near a homoclinic bifurcation of limit cycles, it was found that the statistical properties of escaping from limit cycles can be estimated by analyzing local dynamics near a saddle point. I applied the analysis to models for cellular pacemaker neurons and showed a good agreement between analysis and simulation.

REFERENCE