

WORKSHOP
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Noise-induced bursting oscillations

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Abstract

We consider a phenomenological model of a square-wave bursting neuron in the regime of tonic spiking but close to the transition to bursting. Under small random perturbations, the model generates irregular bursting. In this work, we study the statistical properties of the emergent bursting patterns. For this, we derive a Poincaré map for the randomly perturbed system. The analysis of the first return map yields the distributions of the number of spikes within one burst and the interspike time intervals and reveals their dependence on the small and control parameters present in the model.

This is a joint work with Pawel Hitczenko (Drexel University).