

ASYMPTOTIC PROPERTIES OF STEIN'S NEURONAL MODEL

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A neuron is an electrically excitable cell that processes and transmits information through electrical signals. Our aim is to describe and study the evolution of probability density for membrane potential using the semigroup approach [3]. We shortly recall Stein's model and we present it as a piecewise deterministic Markov process. Then we introduce a stochastic semigroup related to this model. We give a new theoretical result on asymptotic stability of stochastic semigroups. This result is based on a decomposition theorem of a stochastic semigroup into asymptotically stable and sweeping components [1, 2]. We apply the general result concerning asymptotic stability of stochastic semigroups to Stein's model. Finally, we compare asymptotic properties of models with and without the refractory period.

REFERENCE

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