

Kinetic models for neural networks

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Abstract

Neurons exchange informations via discharges, propagated by membrane potential, which trigger firing of the many connected neurons. How to describe large networks of such neurons? What are the properties of these mean-field equations? How can such a network generate a spontaneous activity?

Such questions can be tackled using nonlinear integro-differential equations. These are now classically used in the neuroscience community to describe neuronal networks or neural assemblies.

The voltage and conductance play the role of space and velocity in traditional kinetic equations.