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Synchronization, Multistability and Clustering: how useful are predictions from phase models?

We consider a model of a network of hippocampal interneurons based on the work of Wang and Buzsaki. We construct a phase model representation of the network, and show that this model can give reasonably accurate quantitative information, such as the size of basins of attraction and the maximum heterogeneity permissible in the inherent frequencies of the neurons before synchrony is lost. We show that predictions of existence and stability of the synchronous solution from a two cell network carry over to N-cell networks, either exactly or in the limit of large N.

This is joint work with Jeff Chadwick.