Proposal: Electrical and Inhibitory Coupling Cause Bounded Regions of Synchrony in Networks of Sherman Bursting Neurons

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Abstract

We examine the case of a coupled two-cell Sherman network with electrical and inhibitory coupling. A region of stable synchrony exists when both inhibitory coupling and electrical coupling are nonzero but very weak; notably, this region is bounded on all sides by instability. We present an explanation for this curious effects as well as a detailed numerical stability analysis of phase-locking in this island of parameter space.