Chimera States in a Coupled Oscillator Model of the Mouse Brain

Henry Mitchell, Christopher M. Danforth, J. Matt Mahoney, Peter Sheridan Dodds

January 18, 2019

Abstract

The multistable coexistence of coherence and incoherence in a network of coupled oscillators is a well-studied mathematical phenomenon called a chimera state. Recently, researchers have studied the presence of chimera states in brain models of cats. By sweeping through values of various parameters of the neural model in question, one can determine the basins of attraction of certain types of chimera states. In this work, we investigate the parameter landscape leading to chimera-like states in a network implementation of the Hindmarsh-Rose neuronal model on a mouse connectome. We also investigate the aggregate behavior of the oscillators in the network as the chimera states collapse into total synchrony.