# Clustering and synchronization: Dimension Reduction in Neuronal Oscillator Networks

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**Abstract:**

Oscillations are ubiquitous in the brain but their role is not completely understood. We study synchronization properties and clustering in oscillatory neuronal networks by applying recently developed techniques for dimension reduction on modular and heterogeneous networks [Vegué et al, PNAS Nexus 2023]. We present a reduced version of the system whose time evolution is easier to predict while preserving some of the key dynamical features of the original system, in particular the different synchronization patterns and the bifurcations giving rise to them.