

A study of Kuramoto oscillators with higher-order interactions and rotational symmetry breaking

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Beyond the classic pairwise coupling, higher-order interactions have been shown to have a deep effect on the resulting dynamics of the network. Different dynamical states have been observed in networks with higher-order interaction, including synchronized states, explosive transitions, and chimera states. We study the Kuramoto model with higher-order interactions that break rotational symmetry of the original system. We use the Wanatabe-Strogatz approach to obtain a low-dimensional representation of the system, which allows us to identify several bifurcations in the parameter space. With this, we find a diversity of dynamical states, including alternating chimeras. Our results shed light into the underlying mechanism for the emergence of different spatiotemporal patterns, which may help studying these states in biological and realistic systems.

Type

ORAL