Abstract

"Self-Organized Quasiperiodicity in Oscillator Ensembles with Global Nonlinear Coupling"

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We describe a transition from fully synchronous periodic oscillations to partially synchronous quasiperiodic dynamics in ensembles of identical oscillators with all-to-all coupling that nonlinearly depends on the generalized order parameters. We present an analytically solvable model that predicts a regime where the mean field does not entrain individual oscillators, but has a frequency incommensurate to theirs. The self-organized onset of quasiperiodicity is illustrated with Landau-Stuart oscillators and a Josephson junction array with a nonlinear coupling.