

Phase Desynchronization as a Mechanism for Transitions to High-Dimensional Chaos

ZHENG Zhi-Gang and HU Gang

Department of Physics, Beijing Normal University, Beijing 100875, China
(Received: 2000-8-15; Revised: 2000-10-19)

Abstract: Phase is an important degree of freedom in studies of chaotic oscillations. Phase coherence and localization in coupled chaotic elements are studied. It is shown that phase desynchronization is a key mechanism responsible for the transitions from low- to high-dimensional chaos. The route from low-dimensional chaos to high-dimensional toroidal chaos is accompanied by a cascade of phase desynchronizations. Phase synchronization tree is adopted to exhibit the entrainment process. This bifurcation tree implies an intrinsic cascade of order embedded in irregular motions.

PACS: 05.45.Xt

Key words: phase synchronization, phase localization, Lyapunov exponents

[\[Full text: PDF\]](#)

Close