

Quasiperiodic forcing of coupled chaotic systems

Manish Agrawal

Department of Physics, Sri Aurobindo College, University of Delhi, New Delhi 110017, India

We study the manner in which the effect of quasiperiodic modulation is transmitted in a coupled nonlinear dynamical system. A system of Rössler oscillators is considered, one of which is subject to driving, and the dynamics of other oscillators which are, in effect, indirectly forced is observed. Strange nonchaotic dynamics is known to arise only in quasiperiodically driven systems, and thus the transmitted effect is apparent when such motion is seen in subsystems that are not directly modulated. We also find instances of imperfect phase synchronization with forcing, where the system transits from one phase synchronized state to another, with arbitrary phase slips. The stability of phase synchrony for arbitrary initial conditions with identical forcing is observed as a general property of strange nonchaotic motion [1].

[1] M. Agrawal, A. Prasad, and Ram Ramaswamy, Phys. Rev. E **81**, 026202 (2010).