



Synchrony suppression in ensembles of coupled oscillators via adaptive vanishing feedback

SPEAKER

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Professor Michael Rosenblum has been a research associate in the Department of Physics, Potsdam University since 1997. His main research interests are the application of oscillation theory and nonlinear dynamics to biological systems and time series analysis. He was a Humboldt fellow at the Max-Planck research group on non-linear dynamics, and a visiting scientist at Boston University. Professor Rosenblum studied physics at Moscow Pedagogical University, and went on to work in the Mechanical Engineering Research Institute of USSR Academy of Sciences, obtaining a PhD in physics and mathematics.

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Where: Skoltech, Room 408, TPOC-3 (Blue Building)

ABSTRACT

Synchronization and emergence of a collective mode is a general phenomenon, frequently observed in ensembles of coupled self-sustained oscillators of various natures. In several circumstances, in particular in cases of neurological pathologies, this state of the active medium is undesirable. Destruction of this state by a specially designed stimulation is a challenge of high clinical relevance. Typically, the precise effect of an external action on the ensemble is unknown, since the microscopic description of the oscillators and their interactions are not available. We show that, desynchronization in case of a large degree of uncertainty about important features of the system is nevertheless possible; it can be achieved by virtue of a feedback loop with an additional adaptation of parameters. The adaptation also ensures desynchronization of ensembles with non-stationary, time-varying parameters.

HOSTS: Dmitry Dylov
 Nikolay Brilliantov

