Berlin Center for Studies of Complex Chemical Systems

Fritz-Haber-Institut der Max-Planck-Gesellschaft, Humboldt-Universität, Max-Delbrück-Centrum für Molekulare Medizin, Otto-von-Guericke-Universität Magdeburg, Physikalisch-Technische Bundesanstalt, Technische Universität Berlin, Universität Potsdam.

Seminar

Complex Nonlinear Processes in Chemistry and Biology

Honorary Chairman: G. Ertl.
Organizers: M. Bär, C. Beta, H. Engel, M. Falcke, M. J. B. Hauser, J. Kurths, A. S. Mikhailov, P. Plath, L. Schimansky-Geier, and H. Stark.

Friday, 7th December, 2012, 16:00 s.t.
Address: Richard-Willstätter-Haus, Faradayweg 10,14195 Berlin, U-Bahnhof Thielplatz (U3).

Dr. R. Tönjes

Potsdam University

Synchronization of weakly perturbed Markov-chain oscillators

Rate processes are simple and analytically tractable models for many dynamical systems that switch stochastically between a discrete set of quasistationary states. However, they may also approximate continuous processes by coarse-grained, symbolic dynamics. In contrast to limit-cycle oscillators that are weakly perturbed by noise, in such systems, stochasticity may be strong, and topologies more complicated than a circle can be considered. Here we apply a second-order time-dependent perturbation theory to derive expressions for the mean frequency and phase diffusion constant of discrete-state oscillators coupled or driven through weakly time-dependent transition rates. [PRE 84, 056206 (2011)]

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