



Seminar

Synchronization Patterns in Complex Networks: Chimera States and Beyond



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Prof. Dr. Kathy Lüdge, Dr. Anna Zakharova, Dr. Philipp Hövel

Summer Semester 2016
EW 731 – Tuesdays 16:00

The seminar offers perspectives on our current research in the area of Nonlinear Dynamics and Control. The seminar is particularly suitable for BSc and MSc students looking for a final project. Students, who want to obtain a "Seminarschein", are welcome as well.

Collective behavior of coupled nonlinear dynamical systems can take diverse forms, ranging from various synchronization patterns and oscillation suppression to chimera states, which have recently received interest of many researchers. Chimera states in complex dynamical networks represent a phenomenon which can be found in different fields such as physics, chemistry and biology. Chimeras are made up of spatially separated domains of synchronized (spatially coherent) and desynchronized (spatially incoherent) behavior. They arise surprisingly in networks of completely identical units and symmetric coupling topologies. These intriguing patterns are named after a fabulous fire-breathing creature from Greek mythology which has a lion's, a goat's, and a snake's head. As the counter intuitive dynamical state this monster is also composed of incongruous parts. The seminar will focus on various synchronization patterns, chimera states and their applications in diverse fields such as physics, e.g., coupled lasers, biology, e.g., neural networks in the brain, and engineering, e.g., power grids.

References can be found here:

<http://www.itp.tu-berlin.de/schoell/nlds/seminare/>

Schedule and Organization

If you are interested in a particular topic, please contact one of the advisors. Final assignment of the topics will be done on April 19, 2016.

Contact

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Theoretical methods and concepts of application.