



Seminar of the Work Group
Nonlinear Partial Differential Equations
SS 22

Speaker: Dr. Jia-Yuan Dai

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Pattern-Selective Feedback Stabilization of Ginzburg-Landau Spiral Waves

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Abstract

The complex Ginzburg-Landau equation serves as a paradigm of pattern formation and the existence and stability properties of Ginzburg-Landau m -armed spiral waves have been investigated extensively. However, most spiral waves are unstable and thereby rarely visible in experiments and numerical simulations. In this article we selectively stabilize certain significant classes of unstable spiral waves within circular and spherical geometries. As a result, stable spiral waves with an arbitrary number of arms are obtained for the first time. Our tool for stabilization is the symmetry-breaking control triple method, which is an equivariant generalization of the widely applied Pyragas control to the setting of PDEs. This is a joint work with I. Schneider and B. de Wolff (reference: <https://arxiv.org/pdf/2203.01230.pdf>).