Institut für
Angewandte Mathematik

Leibniz
Universität
Hannover

Institut für Angewandte Mathematik
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Oberseminar
Analysis und Theoretische Physik

Prof. Dr. Patrick Guidotti
(University of California - Irvine)

Global Stability for a Thermostat Model

The global asymptotic stability of the unique steady state of a nonlinear scalar diffusion equation with a nonlocal boundary condition is studied. The equation describes the evolution of a temperature profile that is subject to a feedback control loop. It can be viewed as a model for a rudimentary thermostat, where a parameter controls the intensity of the heat flow in response to the magnitude of the deviation from the reference temperature at a boundary point.
The system is known to undergo a Hopf bifurcation when the parameter exceeds a critical value. Results on the characterization of the maximal parameter range where the reference steady state is globally asymptotically stable are obtained by analyzing a closely related nonlinear Volterra integral equation. Its kernel is derived from the trace of a fundamental solution of a linear heat equation. A version of the Popov criterion is adapted and applied to the Volterra integral equation to obtain a sufficient condition for the asymptotic decay of its solutions

This is joint work with Sandro Merino.

Dienstag, 22. Oktober 2019, 15:00 Uhr, Raum c311
Hauptgebäude der Universität

Über Ihren Besuch würden sich freuen:

Prof. Dr. Wolfram Bauer
Prof. Dr. Joachim Escher
Prof. Dr. Elmar Schrohe
Prof. Dr. Christoph Walker