PIMS / AMI Seminar

Monday, October 8, 2012
10:00 a.m.
CAB 229

"Convergence for General Full Discretizations of Center Manifolds for Parabolic Differential Equations"

Professor K. Boehmer
Philipps-Universitaet Marburg

Abstract

For parabolic differential equations, space and time discretization methods, so called full discretizations, are necessary to determine the dynamics on center manifolds. Until now, only very little seems to be known about the convergence of these full discretizations. We show that, allowing stable, center, unstable manifolds, for the standard space discretization methods, the space discrete center manifolds converge to the original center manifolds in the following sense: the coefficients of the Taylor expansion of a discrete center manifold and its normal form converge to those of the original center manifold. Then standard or geometric time discretization methods can be applied to the discrete center manifold system of ordinary differential equations. We prove convergence for these full discretizations and give a short outline for the Hopf-bifurcation as example.