MATHEMATICS DEPARTMENT
North Carolina State University

DIFFERENTIAL EQUATIONS SEMINAR

Wednesday, October 19, 2005
3:00 p.m. 330 Harrelson Hall

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"Existence and stability of multi-pulses with applications to nonlinear optics"

We study the existence and stability of multi-pulses in dynamical systems that arise as traveling-wave equations for a partial differential equation (PDE) with symmetries. We consider reversible, Z_2-symmetric dynamical systems with heteroclinic orbits related via symmetries. The heteroclinic orbits are assumed to undergo an orbit flip bifurcation upon changing appropriate parameters. We construct multi-bump solutions close to the heteroclinic orbits and investigate their PDE stability by using Lin's method and Lyapunov-Schmidt reduction. We apply this abstract theory to a model equation that describes the propagation of pulses in optical fibers with phase-sensitive amplifiers. Our results show that stable multi-pulses exist.

This is a joint work with Bjorn Sandstede.

Graduate students are invited to attend.

For questions, comments, and offers to talk, contact Steve Schecter, schecter@math.ncsu.edu.
Please visit the DE Seminar web page at www.math.ncsu.edu/DE.