Meeting: 1003, Atlanta, Georgia, SS 27A, AMS-SIAM Special Session on Analysis and Applications in Nonlinear Partial Differential Equations, I

1003-35-132 **Russell K. Jackson*** (russjack@bu.edu). *N-pulses and an instability criterion in a class of nonlinearly coupled Schrödinger equations.*

In this work, we examine a bifurcation of pulses in a class of nonlinearly coupled Schrödinger equations. Here, pulses are steady state solutions of these equations and can be considered as orbits homoclinic to the origin in a finite dimensional vector space. The impetus for this bifurcation is the passage (in parameter space) of a single component pulse through degeneracy, where degeneracy refers to the a tangency of the global stable and unstable manifolds of the origin along a pulse. We present a geometric analysis of this bifurcation; demonstrating the presence not only of a multi-component 1-pulse nearby the original one-component pulse, but also of an entire family of alternating N-pulses, for all positive integers N.

Additionally, an instability criterion is given that allows us to use the geometric properties of the pulses in the finite dimensional vector space to characterize the (linear) stability properties of the pulses in the original system of partial differential equations. (Received August 10, 2004)