1036-78-96 **Roy H. Goodman*** (goodman@njit.edu), Department of Mathematical Sciences, NJIT, University Heights, Newark, NJ 07102. *Stability of Trapped Light in Bragg Grating Optical Fiber Defects.*

Coupled backward and forward wave amplitudes of an electromagnetic field propagating resonantly in a Bragg grating optical fiber are governed by the nonlinear coupled mode equations (NLCME). This PDE system has gap soliton solutions that travel at any speed between zero and the speed of light. A recently considered strategy for spatial trapping or capture of gap optical soliton light pulses is based on the appropriate design of localized defects in the periodic structure. Localized defects in the periodic structure give rise to defect modes, which persist as nonlinear defect modes as the amplitude is increased. To be useful in applications, nonlinear defect modes must be stable. In this talk we (a) establish the instability of branches of nonlinear defect states which, for vanishing amplitude, have a linearization with eigenvalue embedded within the continuous spectrum, (b) numerically compute, using Evans function, the linearized spectrum of nonlinear defect states of an interesting multiparameter family of defects, and (c) perform direct time-dependent numerical simulations in which we observe the exchange of energy among discrete and continuum modes. Comparison is made with related phenomena in the nonlinear Schrodinger equation. (Received January 16, 2008)