

Meeting: 999, Nashville, Tennessee, SS 9A, Special Session on Inverse Problems

999-34-147 **Martin Klaus*** (klaus@math.vt.edu), Department of Mathematics, Blacksburg, VA 24061. *On a non-selfadjoint eigenvalue problem arising in fiber optics.* Preliminary report.

It is well known that the nonlinear Schrödinger equation (NLSE) plays a fundamental role in the study of pulse propagation in optical fibers, and that solutions of the NLSE can be obtained via the inverse scattering transform (IST) method. Associated with the IST approach is a non-selfadjoint eigenvalue problem involving a two-component differential system (Zakharov-Shabat system). We will discuss recent results on the existence and location of complex eigenvalues for this system and we will pay special attention to eigenvalues of algebraic multiplicity greater than one. Such eigenvalues occur when two simple eigenvalues collide as certain parameters in the problem are varied. Some new results on the parameter dependence of complex eigenvalues will be presented. (Received August 20, 2004)