GIDEON SIMPSON, University of Toronto, Toronto, ON
Spectral Analysis of Matrix Hamiltonian Operators

We study the spectral properties of matrix Hamiltonians generated by linearizing nonlinear Schrödinger equations about soliton solutions. Using a hybrid analytic-numerical proof, we show that there are no embedded eigenvalues for the 3-dimensional cubic nonlinearity, and other nonlinearities. Though we focus on the 3d cubic problem, the goal of this work is to present a new, robust, algorithm for verifying the spectral properties needed for stability analysis. We also present several cases for which our approach is inconclusive and speculate on ways to extend the method.

This is joint work with J. L. Marzuola (Columbia University).