
TUOC V. PHAN, University of British Columbia

Stable Directions for Degenerate Excited States of Nonlinear Schrödinger Equations

We consider the nonlinear Schrödinger equations $i\partial_t\psi = H_0\psi + \lambda|\psi|^2\psi$ in \mathbb{R}^3 where $H_0 = -\Delta + V$ and λ is a given constant which can be positive or negative. Assume that the potential V is radial and decays sufficiently fast at infinity. Assume also that the linear Hamiltonian H_0 has only two discrete eigenvalues $e_0 < e_1 < 0$ where e_0 is simple and e_1 has multiplicity 3. We show that there exist three branches of excited states and for certain finite codimension subset in the space of initial data, we construct solutions ψ converging to each of these excited states in both non-resonant and resonant cases.

This is a joint work with Stephen Gustafson.