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On the Stability of Solitary Waves

This talk deals with the linear stability of solitary waves. More specifically, we consider the fifth-order KdV equation. First we review the complex structure of solitary wave solutions of this equation. Then we formulate the spectral problem associated with the linearization about solitary waves in terms of the Evans function, a complex analytic function whose zeros correspond to eigenvalues. A numerical framework, based on a fast robust shooting algorithm on exterior algebra spaces is introduced. The algorithm is illustrated by computing the stability and instability of several kinds of solitary waves of the fifth-order KdV equation. This is joint work with T. Bridges (University of Surrey, UK) and F. Chardard (graduate student, Ecole Normale Superieure de Cachan).