

Uniqueness and Stability of Solitary Water Waves

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I will speak on uniqueness and stability issues of solitary waves on the free surface of a two-dimensional steady flow of water over a finite bed, acted upon by gravity. I will begin by giving a precise account of the solitary water-wave problem as a nonlinear pseudodifferential equation involving the Dirichlet-Neumann operator. I will mention existence/nonexistence results and the regularity and symmetry properties of solutions. After briefing on the non-existence and instability results of large-amplitude solitary waves, I will describe the recent work on the non-degeneracy of the linearized equation for small-amplitude waves and its implication for uniqueness and stability.