Reformulation and asymptotic reductions of water and interfacial waves

Mark J. Ablowitz

Department of Applied Mathematics, University of Colorado, Boulder, Colorado, U.S.A.
Tel: 303-492-5502, email: mark.ablowitz@colorado.edu

Abstract:

Nonlocal spectral reformulations of classical water waves and multi-fluid interfacial waves are developed in terms of data only on the free surfaces. The reformulation has a fixed boundary. From the nonlocal spectral system Dirichlet-Neumann series, asymptotic reductions and integral relations can be obtained. In certain limits the Kadomtsev-Petviashvili (KP) and the intermediate KP equation are found and their lump type solutions are obtained numerically.