

Asymptotic reductions of water and internal waves and their solitary waves

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Abstract:

Nonlocal spectral formulations of water and internal waves are a convenient means to obtain asymptotic reductions. We use these systems to obtain high order asymptotic expansions describing one dimensional solitary waves with surface tension and two-dimensional systems including the Benney-Luke (BL) and the intermediate BL equation and their two-dimensional lump-type solitary waves. If time permits, a brief discussion of novel discrete nonlinear wave equations in two dimensional photonic lattices will be included.