A Computational investigation on the dynamics of shallow water waves

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Abstract:

The dynamics of shallow water waves has been an active research area for the past several decades. In this context, there are several models that govern this wave flow. In this study, finite element method based on B-spline interpolation functions are successfully applied to Korteweg-de Vries equation with power law nonlinearity to examine the motion of a single solitary wave whose analytical solution is known. The stability analysis is also carried out for these waves. Also, evolution of solitons is studied with Gaussian and undular bore initial conditions.

Index terms: GKdV Equation, Finite Element Method, Shallow Water Waves.