Abstract

Protection of near shore area by means of artificial structure is an important issue for coastal engineering community. A solitary wave is a wave which propagates without any temporal evolution in shape or size when viewed in the reference frame moving with the group velocity of the wave. The envelope of the wave has one global peak and decays far away from the peak solution of Korteweg de Vries (KdV) equation provides this solitary wave and the numerical solution of this equation is developed using differential quadrature which is an innovative numerical technique. Differential quadrature basically approximates partial derivatives of any order. Time derivative of KdV equation is discretized using classic finite difference method and space derivatives are discretized using differential quadrature technique. KdV equation which is third order non-linear partial differential equations, describe behavior of travelling wave, known as solution. Stability of numerical analysis is evaluated by computing L2 norm and L∞. Application of solitonic solutions are highlighted in the paper. Differential quadrature based numerical scheme is explored in detail in this paper.
References


Index Terms

Computer Science Applied Mathematics

Keywords

KdV equation, differential quadrature, stability