

# Dynamics of Solitary-waves in the Higher Order Korteweg – De Vries Equation Type (I)

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We find new analytic solitary-wave solutions of the higher order wave equations of Korteweg – De Vries (KdV) type (I), using the auxiliary function method. We study the dynamical properties of the solitary-waves by numerical simulations. It is shown that the solitary-waves are stable for wide ranges of the model coefficients. We study the dynamics of the two solitary-waves by using the analytic solution as initial profiles and find that they interact elastically in the sense that the mass and energy of the system are conserved. This leads to the possibility of multi-soliton solutions of the higher order KdV type (I), which can not be found by current analytical methods. – PACS numbers: 03.40.Kf, 02.30.Jr, 47.20.Ky, 52.35.Mw

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