Dynamics of Solitary-waves in the Coupled Korteweg-De Vries Equations

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We find new analytic solitary-wave solutions, having a nonzero background at infinity, of the coupled Korteweg-De Vries equation, using the auxiliary function method. We study the dynamical properties of the solitary-waves by numerical simulations. It is shown that the solitary-waves can be stable or unstable, depending on the coefficients of the model. We study the interaction dynamics by using the solitary-waves as initial profiles to show that the mass and energy of the coupled Korteweg-De Vries can be conserved for a negative third-order dispersion term. — PACS numbers: 03.40.Kf, 02.30.Jr, 47.20.Ky, 52.35.Mw