Dynamics of Combined Solitary-waves in the General Shallow Water Wave Models

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We find new analytic solitary-wave solutions, having a nonzero background at infinity, of the general fifth-order shallow water wave models using the hyperbolic function ansatz method. We study the dynamical properties of the solutions in the combined form of a bright and a dark solitary-wave by using numerical simulations. It is shown that the solitary-waves can be stable or marginally stable, depending on the coefficients of the model. We study the interaction dynamics by using the combined solitary-waves as the initial profiles to show the formation of sech^2-type solitary-waves in the presence of a strong nonlinear dispersion term. – PACS: 03.40.Kf, 02.30.Jr, 47.20.Ky, 52.35.Mw

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