

EXACT SOLUTIONS OF A CLASS OF UNIQUE-NONLINEAR EVOLUTION EQUATIONS

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In this study, we introduce a modified approach of the factorization method to obtain the particular solutions of the Liénard type ordinary differential equations and eventually employ it to obtain the solitary wave solutions of the Korteweg-de Vries (KdV), modified Korteweg-de Vries (mKdV), Rosenau-Hyman (RH) and Nonlinear Schrödinger (NLS) equations. We obtain the solution of the non-integrable RH equation in terms of the Jacobi $sn(u, m)$ function and show that, although robust, it is structurally different from the KdV soliton. We also find the soliton solution of the NLS equation that accounts for the evolution of complex envelopes in an optical medium.
