

Exact Solutions of a Nonlinear Schrodinger Equation with Kerr Law Nonlinearity

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Abstract : A nonlinear Schrodinger equation has been considered for solving by mapping methods in terms of Jacobi elliptic functions (JEFs). The equation under consideration has a linear evolution term, linear and nonlinear dispersion terms, the Kerr law nonlinearity term and three terms representing the contribution of meta materials. This equation which has applications in optical fibers is found to have soliton solutions, shock wave solutions, and singular wave solutions when the modulus of the JEFs approach 1 which is the infinite period limit. The equation with special values of the parameters has also been solved using the tanh method.

Keywords : Jacobi elliptic function, mapping methods, nonlinear Schrodinger Equation, tanh method

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