

Approximate Solution to Non-Linear Schrödinger Equation with Harmonic Oscillator by Elzaki Decomposition Method

Authors : Emad K. Jaradat, Ala'a Al-Faqih

Abstract : Nonlinear Schrödinger equations are regularly experienced in numerous parts of science and designing. Varieties of analytical methods have been proposed for solving these equations. In this work, we construct an approximate solution for the nonlinear Schrodinger equations, with harmonic oscillator potential, by Elzaki Decomposition Method (EDM). To illustrate the effects of harmonic oscillator on the behavior wave function, nonlinear Schrodinger equation in one and two dimensions is provided. The results show that, it is more perfectly convenient and easy to apply the EDM in one- and two-dimensional Schrodinger equation.

Keywords : non-linear Schrodinger equation, Elzaki decomposition method, harmonic oscillator, one and two-dimensional Schrodinger equation

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