عنوان مقاله:

The smoothed particle hydrodynamics method for solving generalized variable coefficient Schrodinger equation and Schrodinger-Boussinesq system

محل انتشار:

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خلاصه مقاله:

A meshless numerical technique is proposed for solving the generalized variable coefficient Schrodinger equation and Schrodinger-Boussinesq system with electromagnetic fields. The employed meshless technique is based on a generalized smoothed particle hydrodynamics (SPH) approach. The spatial direction has been discretized with the generalized SPH technique. Thus, we obtain a system of ordinary differential equations (ODEs). Also, it is clear in the numerical methods for solving the time-dependent initial boundary value problems, based on the meshless methods, to achieve the high-order accuracy the temporal direction must be solved using an effective technique. Thus, in the current paper, we apply the fourth-order exponential time differenceing Runge-Kutta method (ETDRK۴) for the obtained system of ODEs. The aim of this paper is to show that the meshless method based on the generalized SPH approach is suitable for the treatment of the nonlinear complex partial differential equations. Numerical examples .confirm the efficiency of proposed scheme

کلمات کلیدی:

Schrodinger-Boussinesq system, Meshless method, Smoothed particle hydrodynamic method, Fourth-order exponential time differenceing Runge-Kutta method