عنوان مقاله:

Some traveling wave solutions of (۳+۱)-dimensional nonlinear Schrödinger equation

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خلاصه مقاله:

In this work, our main motivation was to find the traveling wave solutions of the (۳+۱)-dimensional nonlinear Schrödinger equation (NLSE), which describes wave propagation dynamics in a nonlinear medium using the extended rational sinh−cosh method. The partial differential equation (PDE) under consideration was transformed into an ordinary differential equation (ODE) using a wave transformation. The resulting solutions of the NLSE are expected to be expressed in the rational forms of hyperbolic functions. After substituting the solutions to the ODE and performing some fundamental calculations, a set of algebraic equations were obtained. Therefore, obtaining solutions for the PDE became equivalent to solving a set of algebraic equations. The unknown coefficients in the solutions in the rational form were found by solving the obtained system. These methods were highly effective and could be employed for discovering exact solutions to a wide range of PDEs in mathematical physics.

کلمات کلیدی:

(۳+۱)-dimensional nonlinear Schrödinger equation; Traveling wave solutions; Extended rational sinh−cosh method

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