Supersymmetry for Schrödinger equation with a position-dependent mass

A.A. Suzko and E.P. Velicheva

Joint Institute for Nuclear Research, 141980 Dubna, Russia

The method of intertwining transformation operators is applied to the generalized Schrödinger equation with a position-dependent effective mass. The first- and second-order Darboux transformations and supersymmetry are considered for the Schrödinger equation with a nonconstant mass. The method allows one to generate potentials with both additional and removal bound states in comparison with the spectrum of an initial potential. It is shown on particular examples how to construct the quantum well potentials with a desired spectrum for the generalized Schrödinger equation. The generalized Darboux transformations in a particular case of a position-independent mass turn into the ordinary expressions for potentials and solutions for the standard Schrödinger equation.