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A simple and effective technique to variationally interpret the structure of SUSY partners of mirror image potentials. (English) Zbl 1447.81132

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Summary: Precise supersymmetric partner potentials can be generated for exactly solvable problems of the stationary Schrödinger equation. Construction of isospectral potential is not always possible for exactly solvable systems. This is a restriction, as most problems are not exactly solvable. Employment of mirror-image property can help to construct an exact isospectral partner of that potential. These potentials have chemical relevance to enantiomers. In this paper, we present a formulation as modelling to explore the form of SUSY pair of these potentials. Through polynomial fit, we correlate all possible basic SUSY partners and optimise it to best fit polynomial to present a typical energy value of N = 50.

MSC:

81Q60 Supersymmetry and quantum mechanics
81Q05 Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics
81R12 Groups and algebras in quantum theory and relations with integrable systems
14J33 Mirror symmetry (algebro-geometric aspects)
41A50 Best approximation, Chebyshev systems

Keywords:

SUSY quantum mechanics; mirror image potentials; isospectrality; enantiomers

Full Text: DOI

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