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Analytical approximation to the solution of the Dirac equation with the Eckart potential including the spin-orbit coupling term. (English) Zbl 1220.81101

Phys. Lett., A 372, No. 13, 2201-2207 (2008).

Summary: By using the supersymmetric WKB approximation approach and the functional analysis method, we solve approximately the Dirac equation with the Eckart potential for the arbitrary spin-orbit quantum number κ . The bound state energy eigenvalues and the associated two-component spinors of the Dirac particles are obtained approximately.

MSC:

- [81Q05](#) Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics
- [81Q60](#) Supersymmetry and quantum mechanics
- [81Q20](#) Semiclassical techniques, including WKB and Maslov methods applied to problems in quantum theory

Cited in **25** Documents

Keywords:

Dirac equation; Eckart potential; pseudospin symmetry

Full Text: [DOI](#)

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