

Solution Of The Dirac Equation For Potential Interaction

Alhaidari, AD

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King Fahd University of Petroleum & Minerals

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Summary

An effective approach for solving the three-dimensional Dirac equation for spherically symmetric local interactions, which we have introduced recently, is reviewed and consolidated. The merit of the approach is in producing Schrodinger-like equations for the spinor components that could simply be solved by correspondence with well-known exactly solvable nonrelativistic problems. Taking the nonrelativistic limit will reproduce the nonrelativistic problem. The approach has been used successfully in establishing the relativistic extension of all classes of shape-invariant potentials as well as other exactly solvable nonrelativistic problems. These include the Coulomb, Oscillator, Scarf, Poschl-Teller, Woods-Saxon, etc.

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