

High Energy Physics - Phenomenology

Dynamical Symmetries of Dirac Hamiltonian

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Several dynamical symmetries of the Dirac Hamiltonian are reviewed in a systematic manner and the conditions under which such symmetries hold. These include relativistic spin and orbital angular momentum symmetries, $SO(4) \times SU_{\sigma}(2)$ symmetry for the Dirac Hydrogen atom, $SU(3) \times SU_{\sigma}(2)$ symmetry for the relativistic simple harmonic oscillator. The energy spectrum in each case is calculated from group-theoretic considerations.

Comments: 15 pages, V3 typos removed and some new material included

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