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Use of a non-relativistic basis for describing the low energy meson spectrum

Abstract

We evaluate the use of harmonic oscillator functions (Laguerre polynomials) in the expansion of the fermionic fields of an effective theory inspired by the formalism of QCD in its Hamiltonian formulation in the Coulomb Gauge. Since the functions involved in such expansion are non-relativistic, the Talmi-Moshinsky transformations are used to recover the translational invariance of the center of mass of the mesonic states. Finally, many-body methods are used to compute a preliminary spectrum for the mesons below 1 GeV.

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