Tools for incorporating a D-wave contribution in Skyrme energy density functionals

mercredi 19 novembre 2014 16:45 (30 minutes)

The possibility of adding a D-wave term to the standard Skyrme effective interaction has beenalready considered in the past. Such a term has been shown to appear in the next-to-next-to-leading order of the Skyrme pseudo-potential.

We developed the necessary tools to incorporate this term in a fitting procedure: first, a mean-field equation written in spherical symmetry in order to describe spherical nuclei and second, the response function to detect unphysical instabilities.

Moreover, the D-wave has already given some promising results : its flexibility allows, for instance, to reproduce both nuclear channels and

global equation of state, thus constraining the new parameters.

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Classification de Session: Théorie et modèles nucléaires

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