

Continuum discretization in a Transformed Harmonic Oscillator Basis and its application to the scattering of weakly bound nuclei

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Abstract

In this contribution, a new method of continuum discretization is presented. The method is inspired in the Transformed Harmonic Oscillator (THO) method [1], which has been for many years successfully applied within the context of Hartree-Fock-Bogoliubov calculations. We show that these ideas can be used to provide a convenient representation of the continuum in scattering calculations involving weakly bound nuclei. As an illustrative example, we present an application of the method to the reaction $d+^{208}\text{Pb}$ at 50 MeV, including s , p and d components for the continuum of the deuteron. We show that the convergence of the method with respect to the number of basis states is very good, and the converged result is in excellent agreement with the standard Continuum Discretized Coupled Channels calculation.

References

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