First Article

Sensitivity of BCS solutions to different odd–even staggering finite-difference formulas

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Abstract

The present work studies the effect of odd–even staggering (OES) value of nuclear masses on the solution of the BCS set of equations. Three finite-difference formulas for the OES are used. First, a comparison between the three different formulas applied to even–even Ti, Fe, Ge, Mo, Te and Sm isotopic chains is introduced. The effect of the three formulas on the outputs of the BCS equations is then investigated. The comparison between the three different formulas as well as their effect on some of the BCS outputs is clearly significant. One of the BCS output parameters, the valence shell occupancy, is compared with the corresponding available experimental values.