Tensor Force Effect on the Structure Evolution in Si Isotopes

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The tensor force effect on the nuclear structure properties for various Si isotopes is studied within the self-consistent Hartree-Fock plus BCS approach. The Skyrme energy density functional has been considered in the particle-hole channel, while the zero range delta-interaction has been employed in the particle-particle channel. In order to correctly treat the pairing correlation, particle-number projection was carried out by the Lipkin-Nogami method [1, 2]. Rotational correction as approximate angular momentum projection is also introduced in order to restore the rotational symmetry [3]. The bulk properties like binding energy, two-neutron separation energy and charge radius are thus investigated with and without tensor force and compared with recent experimental data [4, 5] and the results obtained from the relativistic mean-field formalism [6]. In order to study the tensor effect on the shape evolution, the potential energy surfaces in the triaxial deformation plane are displayed and discussed.

References

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