INVESTIGATION OF Sn ISOTOPES WITH SELF-CONSISTENT MEAN FIELD METHOD

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Many exotic nuclei close to the neutron drip line will be experimentally available by the new generation of radioactive beam facilities in the next years. The effect of neutron excessive on the importance of nuclear structure properties will be thus investigated. Theoretically, many studies are performed for accurate predictions to locate the proton and neutron drip lines as well as to describe the behavior of exotic nuclei. Self-consistent mean field methods are well suited theoretical tools for describing medium and heavy nuclei. In this study, the ground states features of Sn isotopes are investigated by using the Hartree–Fock method with the Skyrme SKM* and SLy4 forces in two different code. The isotopes of Sn are chosen because they have been as first candidates accessible for the charge densities and rms radii determination and as key isotopes for structure studies of unstable nuclei at the electron-radioactive-ion collider in RIKEN. The calculated total binding energies per particle, root mean square (rms) nuclear charge radii, rms nuclear mass radii, rms nuclear proton and neutron radii by using Skyrme Hartree-Fock (SHF)+BCS method are compared with the relativistic mean-field (RMF) theory approaches and experimental ones. The obtained charge densities in two code by using SKM* and SLy4 forces are compared with the experimental data.

Key Words: Skyrme Hartree-Fock (SHF)+BCS method, SKM* and SLy4 parameters, exotic nuclei