

Monopole shift in Neutron-Rich Fluorine Isotopes: A Shell-Model Description

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The new generation of radioactive ion beam facility put new challenges for nuclear structure models to study nuclei very far from both side of stability line. However substantial theoretical progress has been made in nuclear structure calculations. In recent years, there is a pioneering work by Otsuka [1] that the tensor force changes magic numbers and shell structure of exotic nuclei.

The variations in the nuclear mean field, in neutron-rich nuclei are investigated within the framework of the nuclear shell model. The changes in proton single particle levels when going towards exotic neutron rich side are originated mainly from the monopole part of effective proton-neutron interaction. For the application proton monopole shift of neutron rich fluorine isotopes has been calculated for two types of interactions, a schematic zero-range force and a realistic one, based on the G-matrix.

References:

[1] T. Otsuka et al., Phys. Rev. Lett. **95**, 232502(1995).