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Dinucleon correlation enhancement in p-shell nuclei FUMIHARU KOBAYASHI, Niigata University, YOSHIKO KANADA-EN'YO, Kyoto University
— Dinucleon (dineutron or diproton) correlation is one of the most attractive phenomena in the physics of unstable nuclei. A dinucleon is a pair of two nucleons coupled to spin-singlet having a strong spatial correlation, considered to be a bosonic cluster. Dinucleon correlation would be significant for the description of the valence nucleon motion at the nuclear surface of unstable nuclei. To clarify the formation mechanism and the universal properties of dinucleon correlation, we have constructed a framework of dinucleon condensate (DC) wave function, which can describe the detailed dinucleon motion around a core which can be deformed and excited. In this work, we use the antisymmetrized molecular dynamics (AMD) wave functions and the DC wave functions to analyze the effect of the core structure, especially the occupied orbits by the core nucleons, on dinucleon formation in p-shell neutron-rich and proton-rich nuclei (e.g. neutron-rich Li isotopes and proton-rich O isotones). We will show that the LS-favored $0p_{3/2}$ orbits play an important role to dissociate dinucleon components to j-j coupling shell-model components without spatial correlation and that the occupation probability of $0p_{3/2}$ would be a key to the enhancement of dinucleon correlation in p-shell nuclei.

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