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Structure of Be isotopes based on Monte Carlo shell model[1]
TOORU YOSHIDA, NORITAKA SHIMIZU, Center for Nuclear Study, University of Tokyo, TAKASHI ABE, TAKAHARU OTSUKA, Department of Physics, University of Tokyo — We study the properties of low-lying states of Be isotopes based on Monte Carlo shell model (MCSM). We calculate the 2^+ energies and the $B(E2; 2_1^+ \to 0_1^+)$. These values are compared with the experiments and other models. The calculated $B(E2)$ values are comparable with the experiments and other models especially for $^{8,10}Be$. To see the origin of these values, we analyse the intrinsic density. We find two equally weighted distributions of the proton intrinsic density in the ground states of Be isotopes (from $A = 8$ to 12). These distributions correspond to the two α particles. The gradual annihilations of the clear 2α shape with the neutron number are found. After that, We focus on the valence neutrons which are distributed around them. The distributions are understood by the molecular orbits such as σ and π orbits. The role of the valence neutrons for the shapes and $E2$-transition properties is analyzed. We discuss whether these behavior of the structure is consistent with the prediction by other models. We also discuss the results in terms of the breaking of $N = 8$ magicity in ^{12}Be.

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Tooru Yoshida
Center for Nuclear Study, University of Tokyo

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