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Two center molecular structures in light nuclear systems
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In light neutron-excess systems, many kinds of molecular structures are discussed from the viewpoint of the clustering phenomena. In particular, much attention has been concentrated on Be isotopes, and their low-lying states are nicely described by the molecular orbit (MO) model based on the ^{8}Be $= \alpha + \alpha$ core. The neutron MO generated around ^{8}Be core, such as π^- and σ^+ associated with the covalent orbit of atomic molecules, have been shown to give a good description for the low-lying states of these isotopes. In addition, many resonant states, decaying into the fragments of ^{6,8}He, have been observed in recent experiments of Be isotopes. Furthermore, the experimental data of the highly excited states have been accumulated for other systems, ^{18}O, for instance. In this report, we will discuss the molecular structures, which are generated by various two center cores, such as ^{10,12}Be ($= \alpha + \alpha$+2,4N), ^{18}O ($= \alpha+^{12}$C+2N) and ^{10,12}C ($= \alpha + \alpha$+2,4P). We employ the generalized two-center cluster model, which has been successful in the studies of ^{10,12}Be from bound region to continuum region. In particular, we focus on the variation of the molecular structure, which are generated by changing a combination of the cores and excess nucleons. The enhancement factors in reactions, which can identify the intrinsic structures, will also be discussed.

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