

The alpha-cluster model applied to ^{74}Ge

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There are few studies using cluster models in the nuclei around the intermediate and heavy mass regions. The alpha-cluster model is based on the interaction between an alpha particle and a nucleus chosen as a core. This model can be applied to nuclear system where alpha-cluster stability is expected and the application in light and intermediate mass nuclei was able to give consistent descriptions of experimental data[1-8]. In the present work we are expanding these studies to nuclei around the intermediate mass region. Initially, we choose the ^{74}Ge nucleus that can be considered as an alpha particle plus ^{70}Zn . We assume for the alpha core interaction the phenomenological potential developed by Buck et al. [4]. Using Fortran 90 as programming language, the most appropriate for the nuclear structure calculations, we have already developed specific programs for our purpose. Applying the method to the alpha + ^{70}Zn system, we have obtained the low-lying positive and negative parity energy levels and the corresponding wave functions with good accuracy. Calculations focusing other properties, such as transition probabilities between these states, are in progress.

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