Photodisintegration cross section of ^{9}Be in the complex-scaled $\alpha + \alpha + n$ three-body model

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The photodisintegration cross section of ^{9}Be shows different features in different energy regions. In low energy region up to $E_\gamma = 6$ MeV, the cross section is dominated by the electromagnetic transitions into the resonances of ^{9}Be, and has been studied within the $\alpha + \alpha + n$ three-body model. On the other hand, the photodisintegration cross section in higher energy region shows a significant electric dipole strength, considered to be the transition into continuum states of $\alpha + \alpha + n$. It is interesting to discuss the mechanism of the photodisintegration of ^{9}Be in low and higher energy regions on the same footing.

In the present work, we investigate the photodisintegration cross section of ^{9}Be in low and higher energy regions by using the $\alpha + \alpha + n$ three-body model and the complex scaling method (CSM). The purposes of this work are following two: One is to investigate the excited states of ^{9}Be in low energy region connected with the ground state through the electromagnetic transitions. The other is to investigate the mechanism of the dipole transition in ^{9}Be in higher energy region. In the preset work, we employ the $\alpha + \alpha + n$ three-body model and calculate the photodisintegration cross section by applying the CSM to the $\alpha + \alpha + n$ three-body model.

In this contribution, we present our calculated photodisinegration cross section of ^{9}Be. Also, we discuss the mechanism of the dipole transition. Using CSM, we decompose the dipole strength into the contributions of each decay channel, and show that the transitions into the ^{8}Be(2^+) + n continuum states dominate the dipole strength in higher energy region.

Reference

[1] YK, M. Odsuren, T. Myo, and K. Katō, Phys. Rev. C**9**3, 054605 (2016).