
NATURE OF PYGMY DIPOLE RESONANCE IN ^{74}Ge

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The pygmy dipole resonance has in recent years received considerable interest. This is partly due to the advent of new experimental techniques which resulted in novel results available to us for interpretation [1]. In this regard, (α, α') reactions are important in elucidating the isospin nature of these dipole states. In this conference we present results on pygmy dipole states in ^{74}Ge . These states were populated in the $^{74}\text{Ge}(\alpha, \alpha')^{74}\text{Ge}'$ reaction at a beam energy of 48 MeV. We detected gamma rays with the AFRODITE array [2], while for the charged particles two telescopes of square silicon detectors were used. Transitions decaying to the ground state were extracted from the α - γ coincidences with the condition that the excitation energy, E_x , should be nearly equal to the gamma energy, E_γ , i.e. $|E_x - E_\gamma| < 250$ keV. Intensities of transitions in the pygmy region were determined and are compared with the $B(E1)$ strengths obtained from (γ, γ') data [3]. The comparison shows the presence of two different regions in the energy range of these dipole states. In the lower part, between 3 and 5 MeV, the excitation due to the isoscalar probe (α, α') is higher than in the upper part (between 5 and 8 MeV). For the isovector probe (γ, γ') the trend goes on the other way around. Therefore, within the energy range investigated, two kind of dipole states seem to coexist: while at higher energy the results indicate dominant isovector nature of these dipole states, at lower energies the presence of dipole state of predominantly isoscalar nature is well established. These results seem to indicate that the dipole states in the energy region of 6 to 8 MeV do not represent the common scenario of excess neutron oscillation as in the "standard" representation of the pygmy modes. These results also highlight the importance of using a complimentary probe like alpha particles for a more correct interpretation of the results.

REFERENCES

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