Frontiers in Gamma Ray Spectroscopy FIG18

Contribution ID : 16

Un-even transition strengths in A =35 mirror nuclei. A role of isospin mixing

Content :

Nuclei located on or close to the N = Z line have been generated a considerable interest during the last few years. This region gives us a unique opportunity to investigate the fundamental problems in nuclear physics like isospin symmetry of the nuclear interaction. The isospin T is a good quantum number under the fundamental assumptions of charge symmetry and charge independence of the strong nuclear force. If the isospin symmetry holds in nuclear interaction then, the level schemes, the E1 transitions between analog states of mirror nuclei should be identical and, these are forbidden in N=Z self-conjugate nuclei. Therefore, the isospin symmetry breaking effect can be studied by investigating the level structure of conjugate (mirror) or self-conjugate nuclei.

In sd shell region, a striking structural difference between the mirror pair 35Cl-35Ar has been found [1,2]. Large mirror energy (MED) difference and the un-even E1 transition strength between the analog states in these nuclei have been observed. The origin of large MED observed in these mirror pair were explained through Coulomb multipole (CM), Coulomb monopole effects (Cm) and single particle contribution proportional to differences in the differences of neutron and proton orbital occupancies [1,2]. However, the different decay pattern from 7/2- level was not yet justified. J. Ekman et. al., [1] explained these dramatic difference in decay patterns of the 7/2- states in the A = 35 mirror pair through isospin mixing. However, they have not estimated the amount of mixing. We have investigated the structure of these levels from both experimentally and theoretically. We have populated 35Cl-35Ar in the previous INGA experiment at IUAC. We have measured the mixing ratios for a few transitions in 35Ar and from a simple two-state mixing analysis, we have estimated the amount of isospin mixing for these level of interest.

[1] J. Ekman et. al., Phys. Rev. Lett. 92, 132502 (2004).
[2] F. Della Vedova et. al., Phys. Rev. C 75, 034317 (2007).

Primary authors : Dr. BISOI, Abhijit (Indian Institute of Engineering Science and Technology Shibpur)

Co-authors :

Presenter : Dr. BISOI, Abhijit (Indian Institute of Engineering Science and Technology Shibpur)

Session classification : --not yet classified--

Track classification : --not yet classified--

Type : Poster