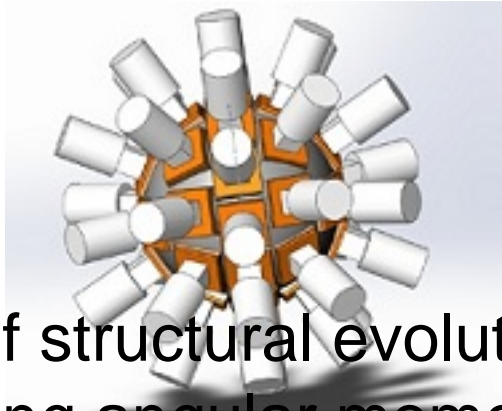


Frontiers in Gamma Ray Spectroscopy

FIG18

Contribution ID : 49



Study of structural evolution with increasing angular momentum in ^{142}Tb

Content :

Transitional nuclei in mass $A\sim 140$ region are crucial laboratory to observe the interesting nuclear structure phenomena and to test variety of nuclear models. Due to the proximity of the spherical shell closures and competing shape (prolate and oblate) driving effects of the high- j ($h11/2$) orbital near the proton and neutron Fermi levels, several novel phenomena, like shape co-existence, shears mechanism, octupole correlation, chiral symmetry breaking and band crossing etc. are expected in the excited spectrum of these nuclei [1,2].

To investigate these novel phenomena due to the availability of the particles and holes in the high j -orbital, such as $\pi h_{11/2}$ and $\nu h_{11/2}$, $\pi (d_{5/2}-n/g_{7/2})$ in this region, the ^{142}Tb ($N=77$) nucleus has been studied. The ^{142}Tb nucleus was previously studied via heavy ion fusion evaporation reactions employing recoil-isomer tagging techniques [3, 4].

The γ -ray spectroscopy of ^{142}Tb was performed by populating the high spin states in this nucleus by a fusion evaporation reaction $^{112}\text{Sn}(^{35}\text{Cl}, 2p3n)^{142}\text{Tb}$ at 195 MeV of ^{35}Cl -beam obtained from the Pelletron Linac Facility at TIFR, Mumbai. The γ -rays were detected using an array with eleven Compton-suppressed clover detectors. The 8.8 mg/cm² thick ^{208}Pb backed enriched ^{112}Sn (99.6%) target of thickness 2.44 mg/cm² was used to produce the residual nuclei.

The detailed analysis is in progress. The details of the experiment, interesting results and the interpretation of the level scheme will be presented.

References:

- [1] Y. S. Chen et al., Phys. Rev. C 28, 2437 (1983).
- [2] E. O. Podsvirova et al., Eur. Phys. J. A 21, 1 (2004).
- [3] C. Scholey et al., Phys. Rev. C 63, 034321 (2001).
- [4] P. J. R. Mason et al., Phys. Rev. C 79, 024318 (2009).

Primary authors : Dr. PAI, H (Saha Institute of Nuclear Physics, HBNI, Kolkata-700064, India)

Co-authors : Mr. ALI, Sajad (Saha Institute of Nuclear Physics, HBNI, Kolkata 700064, India and) ; Ms. RAY, P (Saha Institute of Nuclear Physics, HBNI, Kolkata 700064, India) ; Dr. RAJBANSHI, S (Department of Physics, Dum Dum Motijheel College, Kolkata 700074, India) ; Dr. DEY, Balaram (Saha Institute of Nuclear Physics, HBNI, Kolkata 700064, India)

; Prof. GOSWAMI, A (Saha Institute of Nuclear Physics, HBNI, Kolkata 700064, India) ; Mr. MD. S. R., Laskar (Tata Institute of Fundamental Research, Mumbai) ; Mr. F. S., Babra (Tata Institute of Fundamental Research, Mumbai) ; Dr. BISWAS, S (Tata Institute of Fundamental Research, Mumbai) ; Dr. PALSHEKAR, C.S. (Tata Institute of Fundamental Research, Mumbai) ; Mr. JADHAV, S (Tata Institute of Fundamental Research, Mumbai) ; Mr. DONTI, R (Tata Institute of Fundamental Research, Mumbai) ; Mr. NAIDU, B. S. (Tata Institute of Fundamental Research, Mumbai) ; Mr. VAZHAPPILLY, Abraham T (Tata Institute of Fundamental Research, Mumbai) ; Prof. PALIT, R (Tata Institute of Fundamental Research, Mumbai) ; Mr. BANIK, R (Variable Energy Cyclotron Centre, 1/AF Bidhan Nagar, Kolkata 700064, INDIA) ; Mr. BHATTACHARYA, Soumik (Variable Energy Cyclotron Centre, 1/AF Bidhan Nagar, Kolkata 700064, INDIA) ; Dr. BHATTACHARYYA, S (1Variable Energy Cyclotron Centre, 1/AF Bidhan Nagar, Kolkata 700064, INDIA) ; Dr. MUKHERJEE, G (Variable Energy Cyclotron Centre, 1/AF Bidhan Nagar, Kolkata 700064, INDIA)

Presenter : Dr. PAI, H (Saha Institute of Nuclear Physics, HBNI, Kolkata-700064, India) ; Mr. ALI, Sajad (Saha Institute of Nuclear Physics, HBNI, Kolkata 700064, India and)

Session classification : --not yet classified--

Track classification : --not yet classified--

Type : Poster