

Frontiers in Gamma Ray Spectroscopy

FIG18



Contribution ID : 29

Measurement of Quadrupole moments in neutron rich Iodine nuclei

Content :

Quadrupole moment of the n-rich I nuclei are of extreme importance to understand the single particle energy (spe) and n-n interaction around double shell closure of ^{132}Sn . The energy of the first $5/2+$ level in $N = 84$ Sb come down in energy compared to the neighboring Sb isotopes with $N \leq 82$. This observation is explained with lowering of spe [1] as well as the n-n interaction [2]. Similar anomaly was also observed on quadrupole moments of odd-A Iodine isotopes with $N \leq 82$ and was explained by change in n-n interaction with the increase in neutron number [3].

In the present work, the quadrupole moments of $5/2+$ level of ^{131}I and $3+$ level of ^{132}I are measured using Time Differential Perturbed Angular Correlation technique. The n-rich Iodine isotopes are produced from decay of Te fission fragments produced with $\text{natU}(\phi, f)$ reaction. Radio-chemical separation are performed to separate and dope the carrier free activities of Te in Te metal matrix. The experimental observation has been compared with the shell model calculation using NUSHELLX.

References:

- [1] S. Sarkar and M. Saha Sarkar, EPJA 21, 61(2004).
- [2] L. Corragio et al, PRC 72, 057302 (2005).
- [3] D. W. Hafemeister, PR135, B1089 (1964).

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Session classification : --not yet classified--

Track classification : --not yet classified--

Type : Poster