# Frontiers in Gamma Ray Spectroscopy FIG18

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# Definite spin-parity assignment to bandheads in 126Te, 129Xe and 127I using PDCO


**Content** :

Theoretical understanding of the band structure of nuclei crucially depends on the correct spin-parity assignment to bandheads. The standard techniques of directional correlation ratio and polarization are sufficient to find spin-parity of a state. However, sometimes ambiguity remains; in particular, for the mixed or non-stretched transitions. The data analysis based on the polarization directional correlation (PDCO) often resolves the ambiguity. In our study, the nuclei 126Te [1], 129Xe [2] and 127I were populated via reactions 124Sn (7Li, p4n)126Te, 124Sn(11B, p5n)129Xe and 124Sn(7Li, 4n)127I, respectively. The details of these experiments were published earlier [2, 3]. The latest study on these nuclei [4, 5, 6] do not report any experimental measurement of parity. In our experiments, the clover HPGe detectors acted as Compton polarimeter which allowed us to extract parities and confirm many tentative earlier assignments. Moreover, some earlier assignments were completely changed once we invoked PDCO analysis. For instance, the parity of a bandhead in 127I was changed from positive to negative ((15/2)+ to 15/2⊠). This required a change in the valence particle configuration which was earlier assigned [6] as 3-quasiprotons in positive parity orbit. At least one particle was to be in negative parity orbit. Similarly, bandhead parity was changed from negative to positive for 129Xe [2, 5]. In addition, we confirmed some earlier tentative assignments. The detailed analysis and results will be presented.



[1] Virendra Pasi et al., DAE Symp. Proc. on Nucl. Phys. 56, 442 (2011).
[2] Virendra Pasi et al., JPS Conf. Proc. 6, 030016, (2015).
[3] Bhushan Kanagalekar et al., Phys. Rev. C 88, 054306 (2013).
[4] A. Astier et al., Eur. Phys. J. A, 50, (2014).
[5] Y. Huang et al., Phys. Rev. C 93, 064315 (2016).
[6] B. Ding et al., Phys. Rev. C 85, 044306 (2012).



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