SAIP2014

Contribution ID : 49

Octupole correlations in the rare earth N = 88 isotones

Tuesday 08 Jul 2014 at 17:10 (01h50')

Abstract :

Three experiments have recently been performed at iThemba LABS using the AFRODITE array spectrometer with the digital electronics. The reactions 150Nd (4He, 4n) 150Sm, 150Sm (4He, 2n) 152Gd and 155Gd (3He, 4n) 154Dy have been studied at lower spins in order to investigate the collective and quasi-particle structures of the N = 88 nuclei 150Sm, 152Gd and 154Dy respectively. Structures built on the 02+ states in these isotones are being investigated. The reaction 150Nd (4He, 4n) 150Sm fills a gap in two of our previous studies of 150Sm; 148Nd (4He, 2n) 150Sm to low spin states and 136Xe (18O, 4n) 150Sm at high spins [3, 4]. The difference in the structures populated in 150Sm in these two reactions is most unusual and needs to be understood. Of particular importance is the detailing of the structure of the Kπ = 2+ γ-vibrational band which is only known to the first few states in 150Sm. The properties of such bands indicate if the nucleus is axially symmetric or not and how γ-soft it is. We are also looking for the Kπ = 2+ γ-vibrational band built on the 02+ 2p-2h neutron state which possesses octupole characteristics [5]. The measurements we have made to 152Gd and 154Dy are motivated by the same considerations as our study of 150Sm and with the intention of determining the role that deformation plays in these isotones. [1] R. R. Chasman, Phys. Rev. Lett. 42, 630 (1979).[2] S. Frauendorf, Phys. Rev. C77, 021304(R) (2008).[3] S. P. Bvumbi et al., Phys. Rev. C 87, 044333 (2013).[4] S. P. Bvumbi, PhD thesis, University of Johannesburg, (2013)[5] J. F. Sharpey-Scahafer, proceedings of INPC 2013 (in press).[6] W. Urban, J. C. Bacelar and J. Nyberg, Acta. Phys. Pol. B32, 2527 (2001).

Award :

NO

Level :

PhD

Paper :

YES

Primary authors : Ms. BVUMBI, Suzan Phumudzo (University of Johannesburg)

Co-authors :

Presenter : Ms. BVUMBI, Suzan Phumudzo (University of Johannesburg)

Session classification : Poster1

Track classification : Track B - Nuclear, Particle and Radiation Physics

Type : Poster Presentation