Frontiers in Gamma Ray Spectroscopy FIG18

Contribution ID : 21

EXPLORING THE COLLECTIVE AND NON-COLLECTIVE BAND STRUCTURES IN 123Xe

Content :

The nuclei in the mass region A ≈125 lie between the spherical Tin nuclei and strongly deformed Cerium nuclei; so are transitional with respect to their shapes at low and high angular momenta. The presence of an h11/2 intruder orbital, accessible to both protons and neutrons, govern the shape of the nucleus as these h11/2 nucleons have opposite deformation driving effects. Therefore, the aftermath of this interplay makes this region compelling to study shape evolutions from low to higher spin regions as the nucleus can have a prolate, an oblate or a triaxial shape depending on the alignment of these h11/2 nucleons. An experiment involving a heavy-ion fusion evaporation reaction was carried out at ANL, USA where the high spin states of 123Xe were populated using 80Se(48Ca, 5n)123Xe where a 48Ca beam having 207 MeV beam energy and an intensity of 4 pnA was bombarded on a gold-backed 80Se target. The coincidence events were recorded with the Gammasphere spectrometer. The previously known level scheme was confirmed and enriched with the addition of 5 new band structures and several interband transitions. Cranked Nilsson-Strutinsky calculations were performed and compared to the experimental results in order to assign configurations to the bands.

Primary authors : Ms. BASU, Anwesha (Indian Institute of Technology Kharagpur- 721302, India) ; Prof. SINGH, A. K. (Indian Institute of Technology Kharagpur- 721302, India)

Co-authors : Dr. NAG, Somnath (NIT Raipur, GE Road, Raipur - 492010, India) ; Dr. HAGEMANN, G. B. (Niels Bohr Institute, Blegdamsvej 17, DK-2100 Copenhagen, Denmark) ; Dr. SLETTEN, G. (Niels Bohr Institute, Blegdamsvej 17, DK-2100 Copenhagen, Denmark) ; Dr. HERSKIND, B. (Niels Bohr Institute, Blegdamsvej 17, DK-2100 Copenhagen, Denmark) ; Dr. DØSSING, T. (Niels Bohr Institute, Blegdamsvej 17, DK-2100 Copenhagen, Denmark) ; Dr. RAGNARSSON, I. (Division of Mathematical Physics, LTH, Lund University, P.O.\ Box 118, SE-221 Lund, Sweden) ; Dr. HÜBEL, H (Helmholtz-Institut für Strahlen-und Kernphysik, Universität Bonn, Nussallee 14-16, D-53115 Bonn, Germany) ; Dr. BÜRGER, A. (Helmholtz-Institut für Strahlen-und Kernphysik, Universität Bonn, Nussallee 14-16, D-53115 Bonn, Germany) ; Dr. CHMEL, S. (Helmholtz-Institut für Strahlen-und Kernphysik, Universität Bonn, Nussallee 14-16, D-53115 Bonn, Germany) ; Dr. WILSON, A. N. (R. S. P. E., ANU, Canberra, ACT 0200 Australia) ; Dr. ROGERS, J. (R. S. P. E., ANU, Canberra,

ACT 0200 Australia) ; Dr. CARPENTER, M. P. (Physics Division, Argonne National Laboratory, Argonne, IL 60439, USA) ; Dr. JANSSENS, R. V. F. (Physics Division, Argonne National Laboratory, Argonne, IL 60439, USA) ; Dr. KHOO, T. L. (Physics Division, Argonne National Laboratory, Argonne, IL 60439, USA) ; Dr. KONDEV, F. G. (Physics Division, Argonne National Laboratory, Argonne, IL 60439, USA) ; Dr. LAURITSEN, T. (Physics Division, Argonne National Laboratory, Argonne, IL 60439, USA) ; Dr. ZHU, S. (Physics Division, Argonne National Laboratory, Argonne, IL 60439, USA) ; Dr. KORICHI, A. (CSNSM-IN2P3, F-91405 Orsay Campus, France) ; Dr. FALLON, P. (Nuclear Science Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720, USA) ; Dr. NYAKÓ, B. M. (Institute for Nuclear Research, Hungarian Academy of Sciences, H-4001 Debrecen, Hungary) ; Dr. TIMÁR, J. (Institute for Nuclear Research, Hungarian Academy of Sciences, H-4001 Debrecen, Hungary)

Presenter : Ms. BASU, Anwesha (Indian Institute of Technology Kharagpur- 721302, India)

Session classification : --not yet classified--

Track classification : --not yet classified--

Type : Poster