The 2nd International African Symposium on Exotic Nuclei IASEN2024



Contribution ID: 86

Type: Oral

## First observation of rotational bands in the nucleus 231U

APS/123-QED

D.G. Roux

Rhodes University, Department of Physics and Electronics, Grahamstown 6140, South Africa. S.S. Ntshangase University of Zululand, Department of Physics, Private Bag X1001, KwaDlangezwa 3886, South Africa. R.A. Bark, E.A. Gueorguieva-Lawrie, T.S. Dinoko, P. Jones, J.J. Lawrie, L.P. Masiteng, and O. Shirinda iThemba LABS, National Research Foundation, P. O. Box 722, Somerset West 7129, South Africa. J.L. Easton, B.V. Kheswa, N.A. Khumalo, S.P. Noncela, and J.F. Sharpey-Schafer University of the Western Cape, Department of Physics, Private Bag X17, Bellville 7535, South Africa. S.N.T. Majola Department of Physics, University of Johannesburg, P. O. Box 524, Auckland Park 2006, South Africa. and iThemba LABS, National Research Foundation, P. O. Box 722, Somerset West 7129, South Africa. D. Negi iThemba LABS, National Research Foundation, P. O. Box 722, Somerset West 7129, South Africa. and UM-DAE Centre for Excellence in Basic Sciences, Kalina, Mumbai 400098, India. P.C. Uwitonze Rhodes University, Department of Physics and Electronics, Grahamstown 6140, South Africa. and University of Rwanda, Department of Mathematics, Sciences and Physical Education, 50 Rwamagana, Rwanda. (Dated: November 20, 2024) The -ray spectroscopy of uranium nuclei far from stability is compromised by large ssion cross sections and competition from electron conversion. However, by using a recoil detector to discriminate against the ssion background, together with the afrodite -ray spectometer array, we have observed the rst rotational bands in 231U, to date the lightest odd uranium nucleus shown to exhibit collective structure. Excited states were populated in the 232Th(,5n) reaction at a beam energy of 52 MeV. The data analysis revealed three rotational bands, interpreted as the ground-state band [633]5=2+, yrast band [752]5=2<sup>[A]</sup>, and an excited band [631]3=2+. These conguration assignments are supported by Cranked Shell Model calculations and the electromagnetic properties of the bands. The excitation energy of the [752]5=2⊠ band head is suggested to be 113.0 keV. PACS numbers: 21.10.-k,21.10.Re, 23.20.Lv, 27.70.+q

## Notes

Primary author: ROUX, David G. (Rhodes University)

Presenter: ROUX, David G. (Rhodes University)