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Rotational Spectra of Even–Even Actinide and Rare-Earth Nuclei

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Abstract

Abstract: The new equation derived in the previous paper within the framework of the hydrodynamical model and on the basis that the stretching is quantized is used to produce the energy states in the ground state bands for nuclei in the actinide region and in beta bands for some nuclei selected randomly. The formula showed excellent agreement with experiments. The energy spectra of ground and beta state bands has been calculated of even–even nuclei with mass range $150 < A < 190$ and $228 < A < 246$ respectively. This success of our approach emphasizes that the only factor that affects the behavior of the nucleus within the mentioned ranges is the stretching. © 2023, Allerton Press, Inc.

Index Keywords

Rare earths; Energy spectrum, Even-even nuclei, Ground-state band, Hydrodynamical modeling, Rare-earth nuclei, Rotational spectra; Ground state

References

- Bohr, A., Mottelson, B.
(1997) *Nuclear Structure*, Benjamin, New York
- Bengtsson, R., Frauendorf, S.
(1979) *Nucl. Phys. A*, 327, p. 139.
- Usmanov, P.N., Mikhailov, I.N.
(1997) *Phys. Part. Nucl*, 28, p. 348.
- Usmanov, P.N., Okhunov, A.A., Salikhbaev, U.S., Vdovin, A.I.
(2010) *Phys. Part. Nucl. Lett.*, 7, p. 185.
- Usmanov, P.N., Vdovin, A.I., Yusupov, E.K., Salikhbaev, U.S.
(2019) *Phys. Part. Nucl. Lett.*, 19, p. 706.
- Usmanov, P.N., Vdovin, A.I., Nishonov, A.N.
(2022) *Bull. Russ. Acad. Sci.: Phys.*, 86, p. 918.
- Okhunov, A.A., Turaeva, G.I., Hasan, A.K., Khandaker, M.U., Rosli, N.B.
(2015) *Chin. Phys. C*, 39, p. 044101.
- Harris, S.M.
(1965) *Phys. Rev. B*, 138, p. 509.
- Abu El Sheikh, M.K.M., Okhunov, A.A., Abu Kassim, H., Khandaker, M.U.
(2020) *Chin. Phys. C*, 44, p. 084101.
- Abu El Sheikh, M.K.M., Okhunov, A.A., Abu Kassim, H., Leong, Y.T.
(2022) *J. Sains Malays.*, 51, p. 1213.

- Diamond, R., Stephens, F., Swiatecki, W.
(1964) *Phys. Lett.*, 11, p. 315.
- Mariscotti, M., Scharf-Goldhaber, G., Buck, B.
(1963) *Phys. Rev.*, 178, p. 1864.
- *Nudat.*,

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