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The Prediction of Moment of Inertia of Rotating Nuclei

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Abstract

In this paper the mathematical expression which is given by Bohr for the moment of inertia of even-even nuclei on the basis of the hydrodynamical model is modified. This modification is on the kinetic energy of the surface oscillations including the second and third terms of R^{-2} expansion as well as the first term which was already carried out by Bohr. Therefore, this work can be considered

the continuation and support of the hydrodynamic model of Bohr. This procedure results in a Bohr formula to be multiplied by a factor which depends on the deformation parameter. Bohr (modified) formula is examined by applying it on axially symmetric even-even nuclei with atomic mass ranged between 150 and 190 as well as to some triaxial symmetry nuclei. The modification of Bohr's formula are discussed including the information on how stable this modification with including second and third terms of R^2 expansion of Bohr's formula. The results of calculation are compared with the experimental data and the results of Bohr, based earlier. The obtained results are in a good agreement with experimental data by describing almost 0.7% and better than that of the unmodified ones.

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