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EXTRAPOLATION OF THE LOWEST STATE ENERGIES IN SUPERHEAVY EVEN-EVEN NUCLEI

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In this report the various approaches [1,2,3] to the state energy estimations for su-perheavy nuclei are discussed. In [1,2], for even-even nuclei, a correlation between the state energies and the deformation energies was found and parametrization of the correlation curve was obtained. For determination of extrapolation parameters the experimentally known energies of states were applied. If the proposed parametrization is successful, then it can be used to predict the unknown energies. For such prediction it is necessary to have data on deformation energies obtained within the framework of a unified technique. In different versions of the calculation, the deformation energies may differ, but its correlations with the energy – remain. In different versions of the calculation the deformation energies differ, but this leads only to a change in the scale along the energy axis, and don't change the form of the correlation curve. Our estimations show, than determination of the unknown energies for superheavy nuclei from the correlation curve have the accuracy corresponding to the accuracy of the discussed extrapolation curves. In [3] the microscopic variant of the Grodzins relation derived based on the geometrical collective model and a microscopic approach to the description of excitation energies of the states for nuclei. In this case, the starting point of the prediction is not the deformation energy, but the value of the deformation parameter.
In this paper, we consider several variants [4, 5] of the deformation energy calculations. Obtained extrapolations are presented in two figures. At the first the deformation energies in accordance with [4] and two extrapolations are considered - without and taking into account nuclei with state energies greater than 60 keV. The second figure shows the extrapolation according to the data from [5]. From the presented correlation curves, the estimations of the unknown energies of lowest states are obtained.

The speaker is a student or young scientist

No

Section

1. Nuclear structure: theory and experiment

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