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

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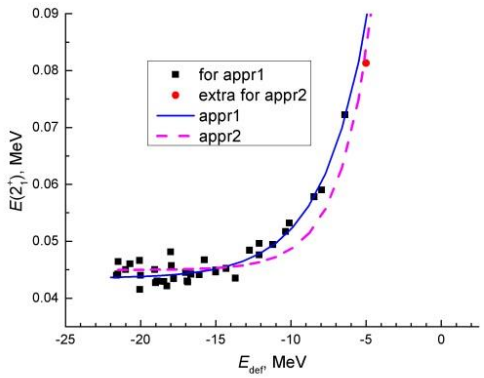
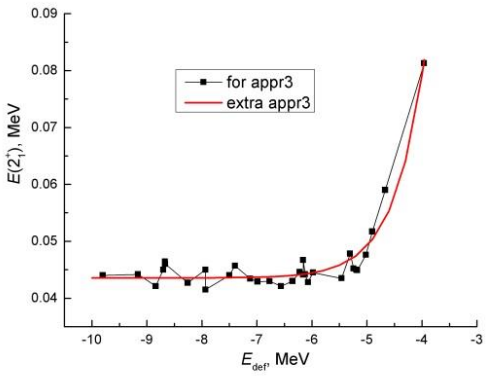
In this report the various approaches [1,2,3] to the 2_1^+ state energy estimations for superheavy nuclei are discussed. In [1,2], for even-even nuclei, a correlation between the 2_1^+ state energies and the deformation energies was found and parametrization of the correlation curve was obtained. For determination of extrapolation parameters the experimentally known energies of 2_1^+ states were applied. If the proposed parametrization is successful, then it can be used to predict the unknown 2_1^+ 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 2_1^+ 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 2_1^+ 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 2_1^+ states for $Z > 100$ 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 2_1^+ 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.





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