

Isotopic dependence of the fission threshold in nuclei with $z=114$ and $z=120$

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Potential energy surfaces of superheavy nuclei are investigated within the multidimensionally constrained relativistic mean-field model [1]. The results are analyzed using the Strutinsky shell-correction method, with particular emphasis on ^{296}Lv and isotopic chains of $Z=114$ and $Z=120$. The analysis reveals that triaxial degrees of freedom substantially reduce the barrier height along the triaxial fission pathway compared to the axial fission path in ^{296}Lv . A steplike behavior emerges in proton shell corrections for $Z=114$ isotopes, contrasting with the smoother patterns observed in $Z=120$ isotopes, is attributed to the differences in the ground-state deformations. The observed correlation between fission-barrier maxima and shell-correction minima points to the shell closures at neutron numbers $N=172$ and $N=184$ at $Z=114$ and 120 .

References

1. E. V. Mardyban, A. Rahmatinejad, T. M. Shneidman, G. G. Adamian, S.-G. Zhou, N. V. Antonenko, Phys. Rev. C **113**, 054308 (2026).