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Exploring the decay probability of neutron-rich superheavy nuclei

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The modes of decay of the even-even isotopes of superheavy nuclei of Z = 118 and 120 with neutron number $160 \leq N \leq 204$ are investigated in the framework of the axially deformed relativistic mean field model. The asymmetry parameter η and the relative neutron-proton asymmetry of the surface to the center R_η are estimated from the ground state density distributions of the nucleus. We analyze the resulting asymmetry parameter η and the relative neutron-proton asymmetry R_η of the density, which play a crucial role in the mode(s) of decay and half-life. Moreover, the excess neutron richness on the surface is found to be an important factor for the β^- decay of a superheavy nucleus.

Summary

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