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Fission of Transactinide Elements Described in Terms of Generalized Cassian Ovals NICOLAE CARJAN, National Institute for Physics and Nuclear Engineering, Bucharest, FEDOR IVANYUK, Institute for Nuclear Research, Kiev, Ukraine — The total deformation energy at scission for Z=100, 102, 104 and 106 isotopes is calculated using the Strutinsky procedure and nuclear shapes described in terms of Cassinian ovals generalized by the inclusion of three parameters: α_1, α_4 and α_6. The corresponding fragment-mass distributions are estimated supposing they are due to thermal fluctuations in the mass asymmetry degree of freedom. For these four series of isotopes the experimentally observed transition from asymmetric to symmetric fission, that happens with increasing mass number A, is qualitatively reproduced. In lighter isotopes (e.g. ^{254}Fm and ^{254}Rf) two mass-asymmetric fission modes are predicted to occur with comparable yields: one having compact and the other elongated scission configurations. On the other hand, in heavier isotopes (e.g. ^{264}Fm and ^{264}Rf) the fragment-mass distributions are predicted to be narrow single-peaked around A/2 corresponding to essentially one mass-symmetric fission mode. The mass distributions are estimated separately for each fission mode, in order to display their inversion when A increases. Finally the distributions of the total kinetic energy of the fragments are calculated for the same isotopes. Qualitative agreement with data is obtained.

Nicolae Carjan
National Institute for Physics and Nuclear Engineering, Bucharest

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