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Deformed nuclear shells in mass and energy distributions of fission fragments of 236U* compound nucleus in 232Th(α,f) reaction at alpha particle energy near the coulomb barrier

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Deformation of nucleus has a significant influence on nuclear shells changing them and replacing traditional spherical closed shells with deformed ones. Actinide nuclei are not spherical in their ground state, excitation and fission deforms them further. The effects of deformed nuclear shells are most pronounced in mass and energy distributions of fission fragments of excited nuclei. But excitation energy of nucleus should not be too high because it will then lead to charged liquid droplet effects dominating over deformed nuclear shells and displacing them. That is why to study presence and influence of deformed nuclear shells we measured mass and energy distributions of fission fragments of 236U* compound nucleus in 232Th(α ,f) reaction at incident alpha particle energies of 24 and 29 MeV which is lower and at coulomb barrier for this reaction. Measurements were carried out with 2E method at U-150M accelerator at the Institute of Nuclear Physics, Almaty city, Kazakhstan. Acquired mass and energy distributions were decomposed into yield of separate fission modes with sensitive decomposition method taking into account deformed nuclear shells. The results show influence of deformed nuclear shells Z52, N84, N88 and influence of excitation energy on mass and energy distributions of fission fragments.

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