

FISSION MODES AND DEFORMED NUCLEAR SHELLS IN MASS AND ENERGY DISTRIBUTIONS OF FISSION FRAGMENTS OF ^{237}Pu COMPOUND NUCLEI FORMED IN $^{233}\text{U}(\alpha, f)$ REACTION AT 24 AND 29 MeV INCIDENT ALPHA PARTICLE ENERGY

A. Pan¹, A. Dilshod¹, D. Janseitov^{1,2}, K. Kovalchuk¹, R. Kosherbayeva¹

¹*Joint Institute for Nuclear Research;* ²*Institute of Nuclear Physics, Kazakhstan*

E-mail: sof villain1993@gmail.com

Mass and energy distributions of fission fragments of ^{237}Pu compound nuclei formed in $^{233}\text{U}(\alpha, f)$ reaction at 24 and 29 MeV incident alpha particle energy were measured at U-150M cyclotron at Institute of Nuclear Physics, Almaty, Kazakhstan using 2E method. Measured distributions at two different compound nuclei excitation energies were each decomposed into separate yields from fission modes and deformed nuclear shells using a method that takes into account mass yield, average total kinetic energy and variance of average total kinetic energy. This method also assumes that mass yield of each mode and each deformed shell has a shape of gauss distribution. Such assumption reduces the number of parameters required to fit experimental data and as such increases the sensitivity of the method to yields of weaker deformed shells. This allowed to separate yield of $Z = 50$ spherical shell from yield of $Z = 52$ deformed shell, yield of $N = 88$ deformed shell from yield of $N = 84$ deformed shell and yield of $N = 50$ spherical shell from yield of $N = 46$ deformed shell.