

INVESTIGATION OF FISSION MODES OF ^{248}Cf AND $^{254,256}\text{Fm}$ FORMED IN THE REACTIONS WITH HEAVY IONS

Friday, 15 July 2022 15:20 (20 minutes)

The role of closed proton and neutron shells in the fission of ^{248}Cf and $^{254,256}\text{Fm}$ nuclei at excitation energies from 40 to 56 MeV was studied. Earlier, multimodal fission of the light ^{233}Pa [1] as well as the heavy No [2] actinide nuclei was observed. Moreover, for these nuclei the manifestation of the superasymmetric fission mode was found. To check the presence of the fission modes in the central region of actinide nuclei the mass-energy distributions of fragments formed in the $^{16}\text{O}+^{232}\text{Th}$ and $^{16,18}\text{O}+^{238}\text{U}$ reactions at energies near the Coulomb barrier have been measured. The experiments were carried out at the U-400 and U-400M accelerators at the Flerov Laboratory of Nuclear Reactions using the double-arm time-of-flight CORSET spectrometer [3]. An increase in the mass yields in the asymmetric region caused by the shell effects was observed. To describe the mass and energy distributions of the fission fragments a multimodal analysis was performed.

References:

- [1] A.N. Pan, E.M. Kozulin, I.M. Itkis et al., Bull. Russ. Acad. Sci. Phys., 2018, vol. 82, p. 721.
- [2] K.B. Gikal, E.M. Kozulin, I.M. Itkis et al., Bull. Russ. Acad. Sci. Phys., 2018, vol. 82, p. 716.
- [3] E.M. Kozulin, A.A. Bogachev, M.G. Itkis et al., Instrum. Exp. Tech., 2008, vol. 51, p. 44.

The work was supported by the Program # BR09158499 of the Ministry of Energy of the Republic of Kazakhstan.

The speaker is a student or young scientist

Yes

Section

1. Experimental and theoretical studies of nuclear reactions

Primary author: OSTROUKHOV, A.A. (JINR)

Co-authors: Mr KOZULIN, E. M. (JINR); Mr BURTEBAYEV, N. T. (Institute of Nuclear Physics, Almaty); Mr BOGACHEV, A. A. (JINR); Mr GIKAL, K. B. (JINR); Mrs ITKIS, I. M. (JINR); Mrs KNYAZHEVA, G. N. (JINR); Mrs KVOCHKINA, T. N. (Institute of Nuclear Physics, Almaty); Mr MUKHAMEJANOV, Y. S. (JINR); Mr NOVIKOV, K. V. (JINR); Mr PAN, A. N. (Institute of Nuclear Physics, Almaty)

Presenter: OSTROUKHOV, A.A. (JINR)

Session Classification: Experimental and theoretical studies of nuclear reactions