

## CHARGE DISTRIBUTIONS FOR NUCLEI-ISOBARS DURING $^{238}\text{U}$ PHOTOFISSION

Wednesday, 13 July 2022 11:10 (20 minutes)

An experimental and theoretical study of the charge distribution for isobar nuclei during photofission of  $^{238}\text{U}$  nuclei has been carried out. To study fragments of photofission of  $^{238}\text{U}$  nuclei, a gamma-activation method was used, that is, a method in which the radioactivity induced in the target by a beam of  $\gamma$ -quanta from an accelerator is analyzed. An experiment on the irradiation of a uranium target was carried out on the bremsstrahlung of the RTM55 accelerator of the Institute of Nuclear Physics, Moscow State University, with a beam energy of 55 MeV. The charge distributions of fission fragments were obtained for chains of nuclei with mass numbers: 131, 132, 133 and 139. The results obtained in the experiment were compared with the results of work performed on bremsstrahlung beams of gamma quanta and proton beams and hypotheses of unchanged charge distribution (UCD) and minimum potential energy (MPE).

The most probable  $Z_p$  charges obtained experimentally, as well as deviations from the predictions of the UCD and MPE models, are presented in Table 1 below.

A	$Z_p(\text{exp})$	$Z(\text{UCD})$	$Z_p - Z(\text{UCD})$	$Z_p(\text{MPE})$
131	$51,102 \pm 0,271$	51,068	$0,035 \pm 0,271$	$50,428 \pm 0,057$
132	$51,290 \pm 0,101$	51,457	$-0,167 \pm 0,101$	$51,153 \pm 0,064$
133	$51,530 \pm 0,209$	51,848	$-0,317 \pm 0,209$	$51,768 \pm 0,140$
139	$54,125 \pm 0,001$	54,186	$-0,061 \pm 0,001$	$54,131 \pm 0,072$

Table 1. Comparison of experimental and theoretical values of the most probable charge for chains of nuclei with mass numbers 131, 132, 133, and 139.

### The speaker is a student or young scientist

No

### Section

1. Experimental and theoretical studies of nuclear reactions

**Primary authors:** KUZNETSOV, Aleksander (Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia; Faculty of Physics, Lomonosov Moscow State University, Russia); AVDONIN, E (Lomonosov Moscow State University, Department of Physics); ALBAGHDADI, Omar; BELYSHEV, S (Lomonosov Moscow State University, Department of Physics); IVANOVA, N (Lomonosov Moscow State University, Department of Physics); FURSOVA, N (Lomonosov Moscow State University, Department of Physics); KHANKIN, V (Skobeltsyn Institute of Nuclear Physics, Moscow, Russia)

**Presenter:** KUZNETSOV, Aleksander (Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia; Faculty of Physics, Lomonosov Moscow State University, Russia)

**Session Classification:** Poster session