LXXI International conference "NUCLEUS –2021. Nuclear physics and elementary particle physics. Nuclear physics technologies"

Contribution ID: 362

Type: Oral report

## THE FIRST EXPERIMENTS AT E = 180 MEV ON THE ELECTRON BEAM OF THE LINAC-200 ACCELERATOR TO DETERMINE ISOMERS OF BISMUTH AND LEAD

Tuesday 21 September 2021 17:30 (25 minutes)

In the framework of the "Energy + Transmutation"[1] project, the experiments have been carried out at the LINAC-200 accelerator of JINR. The 209Bi samples were irradiated in the field of bremsstrahlung radiation by the 180 MeV electrons. The bismuth was used as a converter to obtain the bremsstrahlung radiation, Figure 1. The gamma spectra of the 209Bi activated samples were studied using HPGe detectors in a range from 40 to 3000 keV on the spectrometric complex at YASNAPP-LNP and LHEP JINR. The identification of the nuclei and their yields obtained in the 209Bi sample as a result of the irradiation and were carried out under the periods of the half-life time and the ratio of the intensities of the gamma rays in the spectra as well as compared the results with literary data on the study of 209Bi ( $\gamma$ , xn) reactions [2].

The yields of the bismuth nuclei obtained in  $(\gamma, xn)$  reactions at the electron energies E = 60 and 180 MeV are shown in Figure 1.

The yield of the isotopes with A = 202 for E = 180 MeV is up to more than ten times compared with the yield at E = 60 MeV, which makes it possible to effectively study the isomers and structure of the bismuth nuclei and lead with masses of A from 199 to 203.

Fig. 1. The relative yields of the  $(\gamma, xn)$  reactions in 209Bi.

1. S.I. Tyutyunnikov, V.I Stegailov et al., // "NUCLEUS-2020". St-Petersburg, 117-118 (2020).

2. S.S. Belyshev et al., // Eur. Phys. J. A 51, 67 (2015).

**Primary authors:** RASULOVA, F.A. (Joint Institute for Nuclear Research, Dubna); Dr STEGAILOV, Vlardimir (Joint Institute for Nuclear Research)

**Presenters:** RASULOVA, F.A. (Joint Institute for Nuclear Research, Dubna); Dr STEGAILOV, Vlardimir (Joint Institute for Nuclear Research)

Session Classification: Section 2. Experimental and theoretical studies of nuclear reactions

Track Classification: Section 2. Experimental and theoretical studies of nuclear reactions.