Contribution ID: **1930** Type: **Oral**

Mass measurement of neutron-rich nuclides by the multi-reflection time-of-flight method.

Monday 27 October 2025 14:15 (15 minutes)

Precise mass measurement of neutron-rich nuclides is necessary to determine the path of stellar nucleosynthesis during the r-process, which is an important task in modern cosmology. Also, based on these data, it is possible to construct a mass landscape in the neutron-rich part of the chart of nuclides. This, in turn, will allow us to determine the properties of the nuclear structure of such nuclides.

To solve these problems, it is proposed to create a precise mass spectrometer that uses the multi-reflection time-of-flight technique (MR-TOF), in which the mass measurement is based on the time separation of charged ions with different masses. These ions start at the same time with the same kinetic energy and travel the same distance in the same electric field, but they are registered at different times.

In Russia, there are no MR-TOF installations operating at research reactors. The creation of such an installation is proposed on the basis of the unique PIK reactor complex, which will allow studying nuclides with a uniquely large number of neutrons.

The results of the development and creation of a multi-reflective time-of-flight mass spectrometer are presented.

Author: NECHIPORENKO, Yury (Федеральное государственное бюджетное учреждение «Петербургский институт ядерной физики им. Б.П. Константинова Национального исследовательского центра «Курчатовский институт»)

Co-authors: Mr CHENMAREV, Stanislav (Федеральное государственное бюджетное учреждение «Петербургский институт ядерной физики им. Б.П. Константинова Национального исследовательского центра «Курчатовский институт»); Mr GUSEV, Yury (Федеральное государственное бюджетное учреждение «Петербургский институт ядерной физики им. Б.П. Константинова Национального исследовательского центра «Курчатовский институт»)

Presenter: NECHIPORENKO, Yury (Федеральное государственное бюджетное учреждение «Петербургский институт ядерной физики им. Б.П. Константинова Национального исследовательского центра «Курчатовский институт»)

Session Classification: Nuclear Physics

Track Classification: Nuclear Physics