



Contribution ID: 198

Type: **Contributed Oral**

First Year of Physics with NEEDLE Setup

Thursday, 22 August 2024 17:45 (15 minutes)

Nuclei in the vicinity of the proton-drip line are experimentally accessible via fusion-evaporation reactions. The arrays of HPGe detectors used for these studies have to be complemented with ancillary devices, which make possible accurate identification of the reaction channel. The channels with neutron and/or alpha emission lead to the most exotic nuclear structures, which are produced with very small cross-sections. Noteworthy, in gamma spectroscopic studies in this region it is the detection efficiency and selectivity of the ancillary detectors which allow reaching the most exotic and interesting nuclei.

In 2023 the EAGLE gamma spectrometer at the Heavy Ion Laboratory, University of Warsaw, was equipped with the particle detectors: NEDA as a neutron multiplicity filter and DIAMANT for registering protons and alpha particles. The new setup was named NEEDLE. Within the first year of operating, a number of two-week-long experiments were performed. Inter alia, lifetimes of excited states of ^{134}Sm were investigated, and the shape co-existence and octupole correlations in the light Xe-Cs-Ba region were probed. We performed an experiment aiming at the observation of the yrast excited states in ^{57}Cu , an important waiting point in the *rp*-process. The Coulomb Energy Differences between ^{70}Br and ^{70}Se and the high-spin structure of ^{134}Sm were investigated.

In this contribution, the status of the NEEDLE setup, its performances during the last measurements and the highlights from the first physics campaigns will be presented. The possibilities to perform experiments on this setup employing the beams of the HIL's cyclotron will be discussed.

Funding Agency

National Science Center, Poland

Email Address

tatrofil@slcj.uw.edu.pl

Presenter if not the submitter of this abstract

Primary author: JAWORSKI, Grzegorz (Heavy Ion Laboratory, University of Warsaw, Poland)

Co-author: ON BEHALF OF THE EAGLE, NEDA AND DIAMANT COLLABORATIONS

Presenter: JAWORSKI, Grzegorz (Heavy Ion Laboratory, University of Warsaw, Poland)

Session Classification: Applications, Facilities & Instrumentation

Track Classification: Instrumentation and Facilities