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Commissioning of the ACCULINNA-2 fragment separator and its first day experiments

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Radioactive ion beams (RIBs) were obtained recently from the new ACCULINNA-2 in-flight fragment separator which was installed in 2016 at the primary beam line of the U-400M cyclotron [1]. The design parameters of this facility were experimentally confirmed. The RIB intensities obtained at the final focal plane of the separator, the secondary beam purities and transverse profiles of RIBs hitting the physics target were studied. The intensities obtained in the fragmentation reaction ^{15}N (49.7 AMeV) + Be (2 mm) for the RIBs of ^{14}B , ^{12}Be , $^9,^{11}\text{Li}$, $^6,^8\text{He}$ etc, were on average 25 times higher in comparison with the RIBs supplied by the ACCULINNA-1 separator operating in FLNR since 1996. The new ACCULINNA-2 separator will be a basis at the FLNR for research made in the fields of light exotic nuclei near the nucleon stability borders. The first-priority experimental program with RIBs for the new facility will be presented. In particular, ^6He , ^7H , ^{12}Be , ^{13}Li , ^{17}Ne , ^{26}S nuclides and their possible decay schemes proceeding via the $2p$, $2n$ and even $4n$ emission are in the sphere of interests.

Primary author: Mr MAUYEY, Bakytbek (Joint Institute of Nuclear Research)

Presenter: Mr MAUYEY, Bakytbek (Joint Institute of Nuclear Research)

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