



ID de Contribution: 16

Type: Regular talk (YP)

THE NEW FRAGMENT IN-FLIGHT SEPARATOR AT INFN-LNS

jeudi 25 novembre 2021 16:50 (25 minutes)

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Since 2001, the In-Flight Fragmentation method allows the production of Radioactive Ions Beams (RIBs) at Laboratori Nazionali del Sud of INFN (INFN-LNS) [1-3]. An ambitious and massive upgrade project of the k800 Superconducting Cyclotron (POTLNS) is in progress at INFN-LNS. One of the goals of the upgrade is to deliver light and medium masses nuclei with a power up to ≈ 10 kW. This project opens further perspectives to produce RIBs. A future dedicated facility of a new fragment separator FRAISE (Fragment In-flight Separator) is on the way, to exploit the primary beams, with a power of $\approx 3-4$ kW, for the production of high-intensity and high-quality RIBs [1-3]. The high beam intensity achieved with FRAISE requires the use of diagnostics and tagging systems able to operate in a strong radioactive environment and in a wide intensity range. For this reason, we are investigating the possibility to use an array of detectors based on the SiC technology. In this framework, an intense R&D program has been started with the aim to develop the FRAISE facility, as well as a new diagnostics system and a new tagging device. The latter will be especially useful for the CHIMERA multidetector beam line. In this contribution, we report the status and the perspectives of the FRAISE facility as well as the status of the diagnostics and tagging systems.

[1] Russotto P. et al., Jour. of Phys. Conf. Ser., 1014 (2018) 012016 and references therein.

[2] Russo A.D. et al., NIM B, 463 (2020) 418.

[3] Martorana N.S., Il Nuovo Cimento 44 C (2021) 1.

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Classification de Session: New Experimental Tools, Detection Techniques and Facilities

Classification de thématique: New Experimental Tools, Detection Techniques and Facilities: THE NEW FRAGMENT IN-FLIGHT SEPARATOR AT INFN-LNS