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The Upgrade of the Facility EXOTIC

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The facility EXOTIC [1] at the Laboratori Nazionali di Legnaro (LNL, Italy) has been operational for the in-flight production of light Radioactive Ion Beams (RIBs) since 2003. RIBs are produced via two-body inverse kinematics reactions induced by a heavy-ion beam, delivered from the LNL-XTU tandem accelerator and impinging on a gas target. So far, secondary beams of ^{8}Li, ^{7}Be, ^{8}B, ^{10}C, ^{11}C, ^{15}O and ^{17}F have been delivered with intensities between 10^{3} and 10^{6} pps in the energy range of 3-5 MeV/u. These RIBs were mostly used for reaction dynamics studies at Coulomb barrier energies, resonant scattering experiments and measurements of astrophysical interest using the Trojan Horse (indirect) Method. The facility has been recently upgraded to explore the possibility of coupling to the gamma-ray spectrometer AGATA [2], presently installed in the same experimental hall at LNL and located just 2.68 meters downstream the original focal plane of EXOTIC. According to the ion optical simulations, the coupling of EXOTIC and AGATA should be possible with the existing equipment at the cost of a 50%-reduction in the RIB intensity with respect to the original "EXOTIC stand-alone"configuration. A new tracking system based on two large-area x-y sensitive MicroChannelPlate (MCP) detectors is currently under development. The MPCs will be placed along the beam-line to provide an event-by-event reconstruction of the target position hit by the RIB particles and for timing purposes. The perspectives for the combined use of EXOTIC and AGATA will be presented.
[1] F. Farinon et al., NIM B 266, 4097 (2008)
[2] J.J. Valiente-Dobón , et al. NIM A 1049, 168040 (2023)

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University of Padova and INFN-Sezione di Padova

Email Address

marco.mazzocco@pd.infn.it

Presenter if not the submitter of this abstract

Primary authors: MAZZOCCO, Marco (University of Padova and INFN-Sezione di Padova); PIGLIAPOCO, Sara (Dip. di Fisica e Astronomia, Univ. di Padova, and INFN-PD); BRUGNARA, Daniele (INFN-LNL); VALIENTE DOBON, Jose Javier (INFN-LNL)

Presenter: MAZZOCCO, Marco (University of Padova and INFN-Sezione di Padova)

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