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The AGATA Demonstrator at LNL

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The experimental conditions at facilities for radioactive ion beams and for high-intensity stable beams are extremely challenging, requiring levels of efficiency and sensitivity, which cannot be reached with conventional 4π arrays of Compton-suppressed high-purity germanium detectors.
The quest for capable instrumentation pursued in the past few years by the AGATA (EU) and GRETA (US) projects implies covering the full solid angle around the target point with electrically-segmented large-volume germanium detectors, maximizing the peak efficiency and peak-to-total ratio through the identification of the interaction points of the photons within the germanium crystals (pulse shape analysis) and a software reconstruction of the trajectories of the individual photons (γ-ray tracking). The major advantage with respect to the present generation arrays is arguably the excellent spectra quality provided up to relativistic beam velocities, where the Doppler broadening correction is dominated by the position resolution within the individual crystals rather than by the finite opening angle of the detectors.
This contribution will focus on the AGATA project and in particular on the subset of the whole array, known as the AGATA Demonstrator. This instrument has operated from 2009 to the end of 2011 at the Laboratori Nazionali di Legnaro, where it was installed at the target position of the magnetic spectrometer PRISMA. Following the commissioning runs in 2009, the AGATA Demonstrator has been exploited in a two-years experimental campaign. A total of 20 PAC-approved measurements were performed, plus 3 in-beam tests, for a grand total of 148 days of beam time. Given the possibilities offered by the coupling with the PRISMA magnetic spectrometer, the campaign has focused mainly on the study of moderately neutron-rich nuclei populated via multinucleon transfer or deep inelastic reactions. However, the proton-rich side of the nuclides chart has been explored as well by coupling AGATA with other complementary devices such as the TRACE silicon detectors or the scintillators of HELENA and HECTOR. The analysis of all of the performed experiments is still in progress and in this contribution the preliminary results of a few selected of them will be presented.