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The Cross-talk problem for a neutron correlator: preliminary results on the CROSSTEST@LNL experiment for NArCoS

The advent of new facilities for radioactive ion beams mainly rich in neutrons, SPES @ LNL, FRAISE @ LNS and FAIR @ GSI only to give some examples, imposes the joint detection and discrimination of neutrons and charged particles in Heavy radioactive Ion collisions, with high angular and energy resolutions. The construction of novel detection systems suitable for this experimental task is both a scientific and a technological challenge.

The contribution will illustrate the results of recent tests performed on a new plastic scintillator material, the EJ276, both in the "green-shifted" and in the base version, coupled with SiPMs. The contribution will also present preliminary results on the CROSSTEST experiment performed at LNL-INFN in November 2023. The goal of the experiment was the study of the crosstalk issue among the elementary cells of NArCoS (Neutron Array for Correlation Studies), a novel detector for neutrons and charged particles with high energy and angular resolution, based on a 3D cluster of scintillation units. This project is also funded by the Italian Project PRIN ANCHISE (2020H8YFRE) and the INFN experiment CHIRONE.

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