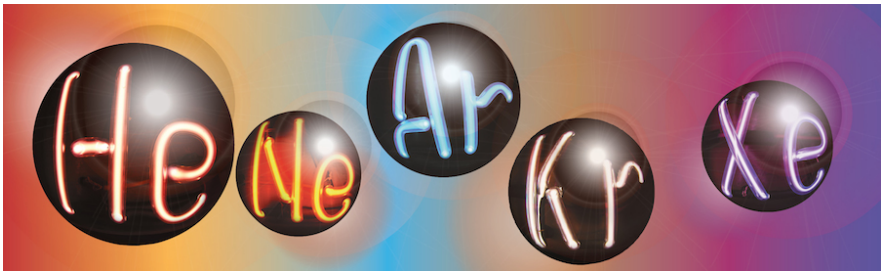

Contribution ID: **32** Type: **Oral**

Scintillation Imaging with Coded Aperture Masks

Wednesday 28 August 2024 09:00 (20 minutes)

Most conventional noble liquid detectors employ scintillation light as either a timing signal for a TPC or as a calorimetric measurement, or both. Its relative amplitude and timing on multiple detectors can also be used to approximately locate an interaction.
Scintillation imaging goes a step further. By developing a suitable optical system, coupled with finely segmented SiPM arrays, it is possible to build photographic cameras that capture images of the primary scintillation light.
In absence of a TPC, scintillation imaging alone can provide vertexing and tracking information, while combined it can enhance resolution and rate capability (which is a concern for near detectors located on powerful neutrino beams).
Both Xe and Ar scintillate in the VUV range, imposing stringent requirements on the optical system and SiPMs. By replacing a traditional set of lenses with a coded aperture mask, a thin and compact camera with both deep and wide field of view can be created, at the modest cost of additional offline processing.
The latest results from simulation and reconstruction of neutrino interactions in a LAr detector equipped with these cameras will be presented. This work was supported by Grant "PRIN 2022KJZSYB". A review of the applications, such as in DUNE/SAND, and the development status of key enabling technologies, such as a large, low power cryogenic ASIC and VUV-enhanced Backside Illuminated SiPMs will also be included.

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Session Classification: Signal reconstruction and identification

Track Classification: Signal reconstruction and identification (analysis methods, simulations): Simulations