



Contribution ID: 151

Type: **Parallel talk**

A novel imaging detector for liquid scintillator experiments

Tuesday 29 August 2023 14:45 (15 minutes)

Detectors based on Liquid Argon or Xenon Time Projection Chambers have been successfully employed in several neutrino and DM experiments.

We propose an alternative method of exploiting the same targets, based on the imaging of their scintillation light, eliminating the dependency on the slow charge collection.

By capturing “pictures” of the LAr (or LXe) scintillation light emission, we aim to reconstruct both event topologies and energy deposition.

Several challenges must be overcome in order to successfully demonstrate this novel approach: the performance of photon detectors and conventional optical elements in the relevant spectral range is limited; thousands of photosensor channels in dense matrices must be read out in cryogenic conditions; a sufficiently wide and deep field of vision is needed to maximize the fiducial volume.

We plan to adopt this technique in GRAIN (Granular Argon for Interaction of Neutrinos): a 1-ton LAr target, part of SAND at the DUNE Near Detector complex.

The current design of GRAIN, its physics goals, the development of its optical elements and image reconstruction algorithms, and preliminary results from a cryogenic demonstrator will be presented.

Submitted on behalf of a Collaboration?

Yes

Author: Dr TOSI, Nicolo (INFN Bologna, Bologna (IT))

Presenter: Dr TOSI, Nicolo (INFN Bologna, Bologna (IT))

Session Classification: Dark matter and Neutrino

Track Classification: Neutrino physics and astrophysics