Contribution ID: **183** Type: **Oral Presentations**

X-ARAPUCA as photon detection system of SBND

Wednesday, 6 September 2023 16:00 (20 minutes)

The SBND (Short Baseline Near Detector) is the near detector of the short baseline neutrino program (SBN) at Fermilab. SBND, is located at 110m from the neutrino beam and will collect an impressive statistic of neutrino-argon interactions. SBND will also serve as test bed for new technologies for LAr-TPCs. In particular SBND implements different and complementary solutions for the detection of LAr scintillation light. LAr light is emitted in a narrow 10 nm band centered around 127 nm, in the Vacuum Ultra-Violet and the shape of the signal is the sum of two exponential decays with very different characteristic times (6 ns and 1,500 ns). Scintillation light can be used to perform calorimetric measurements of the deposited energy, T0 determination of the neutrino interaction and particle discrimination through pulse shape studies.
The Photon Detection System is a combination of traditional, large area (8") photomultipliers and X-ARAPUCAs, a novel detector which is the baseline choice of the Deep Underground Neutrino Experiment.
The PDS will collect not only the direct VUV LAr light, but also the visible one, shifted by the layer of Tetra-Phenyl Butadiene (TPB – emission wavelength around 430nm) deposited on reflective foils installed on the cathode of the TPC. This will allow to test a new version of X-ARAPUCA which is sensitive to visible light, and SBND is the only experiment which will operate this version of X-ARAPUCA.

Primary author: MACHADO, Ana Amelia (UNICAMP)

Presenter: MACHADO, Ana Amelia (UNICAMP)

Session Classification: E2