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The Photon Detection System of SBND

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SBND is the near detector of the Short Baseline Neutrino program at Fermilab. Its near location (110 m) to the neutrino source and relatively large mass (112 ton active volume) will allow studying neutrino interactions on argon with unprecedented precision.

This talk focuses on the SBND Photon Detection System. It represents a major R&D opportunity for the LArTPC technology. Its design is a hybrid concept combining a primary system of 120 photomultiplier tubes, and a secondary system of 192 XARAPUCA devices, all of them located behind the anode plane. Furthermore, covering the cathode plane with highly reflective panels coated with a wavelength shifting compound recovers part of the light emitted towards the cathode, where no optical detectors exist. This new design provides high light-yield and more uniform detection efficiency, an excellent time resolution and an independent position reconstruction (including the drift coordinate) using only the scintillation light.

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