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Photon-Detection System of DUNE Far Detector

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The Deep Underground Neutrino Experiment (DUNE) is a dual-site experiment for long-baseline neutrino oscillation studies, capable of resolving the neutrino mass hierarchy and CP-violation. DUNE will also be sensitive to supernova neutrinos and processes beyond the Standard Model. The Far Detector (FD) will consist of four liquid argon TPCs (17 kton each) equipped with systems for detecting charge and scintillation light produced during ionization. The charge detection system enables both calorimetry and position determination. In addition, the photon-detection system (PDS) enhances the detector capabilities for all DUNE physics drivers. The PDS of the first two FD modules consists of light collector modules, the so-called X-Arapucas, that captures wavelength-shifted (WLS) photons inside boxes where a WLS plate guides the 400 nm photons to SiPMs facing the side surfaces. This presentation will outline their functionality and the operational tests carried out in the lab and its performance in ProtoDUNE.

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