

ARAPUCA: a highly efficient device for photon collection in LArTPCs

For the next generation of large neutrino detectors the Liquid Argon Time Projection Chambers (LArTPCs) are the best choice for optimal performance in particle tracking and calorimetry. The detection of Ar scintillation light plays a crucial role in the event reconstruction as well as time reference for non beam physics such as supernovae neutrinos detection and baryon number violation studies. In this contribution we present an innovative device, the so called ARAPUCA, to enhance Ar scintillation light collection and thus the overall performance of LArTPCs. The ARAPUCA is based on a suitable combination of dichroic filters and wavelength shifters to achieve a high efficiency in light collection. We discuss the operational principles, the current design for the protoDUNE detector and the results of last laboratory tests. Moreover, after appropriate modifications, it can also be used in Dark Matter experiments based on noble gases/liquids detectors.

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