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ARAPUCA light trap for large liquid argon time projection chambers

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ARAPUCA is a totally innovative device for liquid argon scintillation light detection. It is composed of a passive light collector and of active devices. The latters are standard SiPMs that operate at liquid argon temperature, while the passive collector is a photon trap, which allows to collect light with extremely high efficiency. The total detection efficiency of the device can be tuned by modifying the ratio between the area of the active components (SiPM) and that of the optical window. Few arrays of ARAPUCAs will be installed inside the prototype of the Deep Underground Neutrino Experiment - protoDUNE - and their performances will be compared with those of more standard solutions based on guiding bars. The results of the most recent tests of ARAPUCAs in a liquid argon environment, which led to the actual design for the protoDUNE, will be reported together with the proposal of a photon detection system for the Deep Underground Neutrino Experiment based on ARAPUCAs combined with dielectric mirror foils coated by wavelength-shifter.

Consider for Talk

No

Consider for Poster

Yes

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