

Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Reconstruction Results of Spectral Photon Sorting in Large-Scale Neutrino Detectors SAMUEL YOUNG, BENJAMIN LAND, TANNER KAPTANOGLU, MENG LUO, AMANDA BACON, JOSHUA KLEIN, University of Pennsylvania — The Dichroicon, a Winston-style light concentrator built out of dichroic reflectors, achieves Cherenkov/scintillation separation with minimal photon loss by utilizing a technique called spectral photon sorting. This technique works by diverting long and short wavelength photons to separate photomultiplier tubes (PMTs). This separation allows for the identification of a pure population of Cherenkov photons outside of typical scintillation spectra while still detecting the large amount of scintillation needed for position and energy reconstruction. The separate identification of Cherenkov photons in a bright liquid scintillator provides extra information about the interaction of charged particles with the target, as such photons carry directionality and their ratio to scintillation light can be used for particle identification. Here we discuss reconstruction results in simulations of a next-generation liquid scintillator detector fitted with Dichroicons.

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Date submitted: 08 Jan 2021

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