

Low-energy performance and physics reach of hybrid neutrino detectors

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Optical neutrino detectors have long provided landmark physics results. With the advent of hybrid detector technologies deployable at large scales, the future remains bright. Recent advancements in novel scintillating targets, fast photo-sensors, and chromatic sorting are among the techniques under study for the proposed Theia hybrid detector. By utilizing both Cherenkov radiation and scintillation light, hybrid technology can simultaneously achieve high light yields, direction reconstruction and robust particle identification in a single detector. We present results from Monte Carlo studies for the performance of large hybrid detectors and consider the implications for physics analyses, with a focus on the impact on the detection of CNO solar neutrinos.

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