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Water results from Eos

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Future kilotonne-scale neutrino detectors, such as Theia, aim to leverage new and emerging technologies to simultaneously measure Cherenkov and scintillation light, to enable rich science programs and nonproliferation efforts. To achieve these goals, these hybrid detectors will exploit fast timing photodetectors, novel liquid scintillators, and spectral sorting techniques.

This talk highlights a currently operating technical demonstrator, Eos, which is a novel detector with a fiducial target volume of approximately 4 tonnes, constructed at UC Berkeley and Lawrence Berkeley National Laboratory. Eos serves as a test bed for these emerging technologies required for hybrid Cherenkov/Scintillation detectors, and can accommodate a range of detector targets, including water-based liquid scintillators (WbLS), organic scintillators, and metal-loaded liquids.

Eos deploys an array of calibration sources to validate and improve scintillator and photon detector optical models, to facilitate extrapolation to kilotonne-scale detectors. This talk presents results from the water phase of Eos, with the data collected in 2024 and 2025.

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