

Abstract Submitted
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Improving PROSPECT Oscillation and Spectrum Measurements with Single End Event Reconstruction¹ XIANYI ZHANG, Lawrence Livermore National Laboratory, PROSPECT COLLABORATION — Current discrepancies in the reactor antineutrino flux and spectrum between experimental measurements and models hint at possible oscillations involving a sterile neutrino, and/or misunderstanding of neutrino production in nuclear reactors. PROSPECT, the Precision Reactor Oscillation and Spectrum experiment, aims to investigate the cause of these discrepancies by measuring various short baseline antineutrino spectra from the ²³⁵U-enriched High Flux Isotope Reactor at Oak Ridge National Laboratory. PROSPECT has operated a 4-ton segmented 6Li-loaded liquid scintillator detector, where each end of all longitudinal segments is coupled to a photomultiplier tube (PMT). Updated short baseline oscillation and ²³⁵U antineutrino spectrum measurements have recently been released. However, a subset of PMTs were unable to operate during the entire data acquisition period used. Here, we also describe the calibration and event reconstruction efforts made to improve the sensitivity of PROSPECT physics measurements using pulse shape information collected in segments with a single functional PMT.

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