

Abstract Submitted  
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**Optical Simulations and Studies with the PROSPECT-20 Detector** NATHANIEL STEMEN, New York Univ NYU, PROSPECT COLLABORATION — The PROSPECT (Precision Reactor Oscillation and SPECTrum) experiment at the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory will make a precise measurement of the reactor antineutrino spectrum from a highly-enriched uranium nuclear reactor while also probing for short-baseline oscillations as a signature of possible sterile-neutrinos. Two liquid scintillator detectors at distances of 7-10m and 16-20m from the reactor will identify inverse beta decay events initiated by reactor antineutrinos. The near detector will be divided into optically separated segments filled with lithium loaded liquid scintillator read out by photomultiplier tubes (PMTs) on either end. Light guides will be employed to direct photons from the scintillator cells to the active PMT photo-cathodes. An optical simulation was built to optimize the performance of the detectors with respect to both light collection and detector uniformity and guide the design of the scintillator cells. We present experimental data and simulation results from the PROSPECT-20 prototype detector.

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