



Poster session 3 – Wednesday 6 July

P3.056 Searching for sterile neutrinos with the PROSPECT experiment

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PROSPECT is a multi-phase short-baseline reactor experiment that will be installed at the Oak Ridge National Laboratory's High Flux Isotope Reactor. PROSPECT's segmented ${}^6\text{Li}$ -doped liquid scintillator detectors will provide precision measurements of the ${}^{235}\text{U}$ -produced reactor antineutrino energy spectrum at a wide range of baselines. The PROSPECT Phase I detector will span baselines of 7-12 meters, while the multi-detector PROSPECT Phase II will extend this coverage to ~ 19 meters. By comparing simultaneously-measured spectra between differing baselines within a single detector or between detectors, PROSPECT will provide new sensitivity to electron antineutrino oscillations at short baselines that is independent of the underlying reactor flux and spectrum model. PROSPECT will address the current best-fit eV-scale sterile neutrino oscillation parameter space at high confidence level with a single year of Phase I data-taking, and is capable of addressing nearly all suggested parameter space with three years of Phase II data-taking. In this presentation, we describe PROSPECT's oscillation fitting framework, input parameters, and expected sensitivities, while also detailing the impact of input parameter variations and key measurement systematics.