

PROSPECT - A Precision Reactor Oscillation and Spectrum Experiment

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PROSPECT, the Precision Reactor Oscillation and SPECTrum Experiment, is a multi-phased short baseline reactor antineutrino experiment aims to precisely measure the antineutrino spectrum of Highly Enriched U-235 (HEU) reactor and probe the possible neutrino oscillation that involves Δm^2 1 eV scale sterile neutrino. In PROSPECT phase-I, an 14×11 optically segmented Li-6 loaded liquid scintillator (LiLS) detector will be deployed at 7-12m from the High Flux Isotope Reactor (HFIR) at Oak Ridge National Lab (ORNL). PROSPECT is able to measure the spectrum of U-235 to aid the inconsistent between predictive spectral models and latest experimental measurements of reactor antineutrino spectrum within 2 reactor cycles. The oscillation measurement will search the best fit region of sterile neutrino in 1-year data taking. This talk will detail the design of PROSPECT's novel lithium-loaded liquid scintillator-based detector, performance of existing PROSPECT prototypes, and the status of the production detector's construction.

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