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PROSPECT - A Precision Oscillation and Spectrum Experiment

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PROSPECT, the PRecision Oscillation and SPECTrum Experiment, is a multi-phased short baseline reactor antineutrino experiment that aims to precisely measure the U-235 antineutrino spectrum and probe for oscillation effects involving a possible $\Delta m^2 \sim 1 \text{ eV}^2$ scale sterile neutrino. In PROSPECT Phase-I, an optically segmented Li-6 loaded liquid scintillator detector will be deployed at the baseline of 7-12m from the High Flux Isotope Reactor at the Oak Ridge National Laboratory. PROSPECT will measure the spectrum of U-235 to aid in resolving the unexplained inconsistency between predictive spectral models and recent experimental measurements using LEU cores, while the oscillation measurement will probe the best fit region suggested by global fitting studies within 1-year data taking. This talk will introduce the design of PROSPECT Phase-I, the discovery potential of the experiment, and the progress the collaboration has made toward realizing PROSPECT Phase-I.

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