

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

PROSPECT, A US based short-baseline reactor neutrino experiment PIETER MUMM, NIST, PROSPECT COLLABORATION — Several recent calculations of the reactor antineutrino flux have revealed a possible deficit when compared to measurements at baselines between 10-100 m. Similar anomalous results are also seen in other electron antineutrino disappearance experiments. In addition, recent measurements of the shape of the reactor antineutrino spectrum observe statically significant deviations from the calculated spectrum. These discrepancies could be a sign of new physics. Precision measurements of the reactor antineutrino spectrum at very short baselines (order 1-10 m) can be used to probe these anomalies, for example, searching for possible oscillations into sterile neutrino species, as well as provide valuable data for safeguards purposes and reactor flux predictions. Given proper site optimization, detector design, and background reduction, an experiment mounted at a typical US research reactor can provide 5 sigma discovery potential for the favored oscillation parameter space with 3 years of detector live time. We will discuss the technical challenges and recent progress in mounting the PROSPECT experiment.

Thomas Langford
Yale University

Date submitted: 01 Jul 2014

Electronic form version 1.4