

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Detector **Design**
and Background Simulations for the PROSPECT Short-Baseline Reactor Experiment¹ TIMOTHY CLASSEN, Lawrence Livermore Natl Lab, PROSPECT COLLABORATION — PROSPECT is a U.S.-based, multi-phase, 2-detector reactor antineutrino experiment whose primary goals are to probe short-baseline oscillations and perform a precise measurement of the reactor antineutrino spectrum at a research reactor. There are several challenges in developing a detector for such a measurement, including little-to-no cosmic ray attenuating overburden and relatively compact spaces in which the detectors can be deployed. The baseline detector design being considered for the experiment is a segmented organic scintillator array since this arrangement can provide the position resolution required for oscillation studies in a compact geometry as well a topology based event identification capability. To study this design concept the PROSPECT Collaboration has developed a versatile simulation framework in which the geometric parameters characterizing an array can be easily varied. This simulation includes optical photon propagation and realistic background generation to best mimic experimental conditions. In this presentation we will describe this simulation framework and detector design and background response studies performed with it.

¹LLNL-ABS-656230: This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Timothy Classen
Lawrence Livermore Natl Lab

Date submitted: 01 Jul 2014

Electronic form version 1.4