Simulating Light Propagation and Modeling the JSNS^2 Detector

WILLIAM WARNER, Univ of Michigan - Ann Arbor, JSNS2 COLLABORATION
— The J-PARC Sterile Neutrino Search at the J-PARC Spallation Neutron Source
(JSNS^2) aims to prove the existence or non-existence of light sterile neutrinos. JSNS^2
will look for muon-antineutrino to electron-antineutrino oscillations over a 24 m
baseline using the Rapid Cycling Synchrotron (RCS) at the Material and Life Science
Experimental Facility (MLF) in Tokai, Japan. The detector will be composed of two
cylindrical tanks each filled with 25 tons of Gd-doped liquid scintillator with a height
and diameter of 3.4 meters. The RAT analysis tool is used to model the detector
and simulate light propagation within. Pulse shape discrimination methods are
used to distinguish between positrons and neutrons to correctly identify electron-
antineutrino-induced inverse beta decay events amongst cosmic background. This
talk will introduce the JSNS^2 experiment and design, with a focus on simulating
various event classes in the detector.

William Warner
Univ of Michigan - Ann Arbor