

Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Li6-doped PSD Plastic Scintillators for Reactor Antineutrino Detectors¹ VIACHESLAV LI, Lawrence Livermore National Lab, SANDD COLLABORATION — In recent years, significant progress has been made at LLNL in synthesizing a new class of plastic scintillators that support Pulse Shape Discrimination (PSD) and Li-6 doping. Two distinct chemistries have been developed to solubilize Li-6 compounds in organic solvents, in which they are typically insoluble. Elements as large as 40cm have been produced, with efforts continuing to improve manufacturing procedures for larger components. These developments open new opportunities in fast and thermal neutron detection, as well as for reactor antineutrino detectors. Plastic PSD scintillator materials can enable new detector geometries, potentially reduce system complexity, and are straightforward to handle and transport. In this presentation, we will describe the materials and performance metrics. Material performance will be described in the context of the Segmented AntiNeutrino Directional Detector (SANDD), a 64-segment Li6-doped plastic scintillator detector with SiPM readout which would have otherwise been difficult or impossible to realize.

¹LDRD

Viacheslav Li
Lawrence Livermore National Lab

Date submitted: 01 Sep 2020

Electronic form version 1.4