

A ${}^6\text{Li}$ -doped pulse shape sensitive plastic scintillator for ton-scale detector applications

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Large-scale ${}^6\text{Li}$ -doped pulse shape sensitive plastic scintillator is one of several technologies under development within the Mobile Antineutrino Demonstrator project. Liquid scintillator with similar capabilities was one of key aspects of the aboveground reactor antineutrino detection demonstration by the PROSPECT experiment. However, a plastic material is considered a requirement for truly mobile above-ground detection systems suited to reactor monitoring for safeguards. The new formulation of plastic scintillator is being developed in partnership with Eljen Technologies and can be obtained in multi-liter single volumes enabling the construction of segments at meter-scale lengths. We will present a summary of measured performance criteria, which include attenuation length, stability, pulse shape sensitivity, and neutron efficiency measurements. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. LLNL-ABS-853010

Abstract title

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