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SANDD: The development of a highly-segmented plastic-scintillator antineutrino directional detector incorporating SiPM arrays

Pulse-shape-discriminating plastic scintillator doped with Li-6, may lead the way to a next generation of reactor-antineutrino detectors – with particle ID and position sensitivity enhanced by segmentation. This poster highlights the development of these features as the first step towards a Segmented AntiNeutrino Directional Detector (called SANDD). We constructed and tested a module of the SANDD containing an 8x8 array of ~5mm x 5mm rods instrumented with two 64-channel Silicon PhotoMultiplier (SiPM) arrays to demonstrate pulse-shape discrimination for the first time over all 128 channels of a SiPM-based photon readout, enabling neutron/gamma-ray discrimination throughout the volume.

Mini-abstract

Novel Li-6 doped plastic scintillator shows promise for directional reactor-antineutrino detection.

Experiment/Collaboration

SANDD

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