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Scintillation Time Profiles of Slow Organic and Water-Based Liquid Scintillators using a Pulsed Neutron Beam

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Slow organic and water-based liquid scintillators are currently developed and characterized for future large-scale neutrino experiments such as Theia. One goal of these new scintillators is to separate Cherenkov light from scintillation light in a detector. By that, the spatial information improved while keeping the excellent energy resolution of proven organic mixtures.
This contribution focuses on scintillation time profile studies of novel liquid scintillators. We performed liquid scintillator characterization experiments using a pulsed neutron beam at the CN accelerator of INFN Laboratori Nazionali di Legnaro. At different beam energies ranging from 3.5 MeV to 5.5 MeV, the fluorescence time profile of recoil protons was recorded. Differences in the time profiles after gamma and neutron excitation open the window to perform pulse shape discrimination and therefore advance the ability to distinguish the neutrino signal from backgrounds.

Submitted on behalf of a Collaboration?

No

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