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

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Experimental Results and Outlook

Scintillation Time Profile Experiment

Evaluate pulse shape discrimination (PSD) capabilities of slow organic and water-based liquid scintillators to identify neutrino events from neutron-induced background events by characterization of scintillation time profiles after excitation by gammas and neutrons

Hybrid Neutrino Detector THEIA

Separation of Cherenkov radiation from scintillation light to gain directional information of incident particles in a large volume detector (up to 100 kilotons)

Water-based liquid scintillators (WbLS)
Increased ratio of Cherenkov light to otherwise dominant fraction of scintillation

Slow organic scintillators
Characteristic fluorescence times intentionally retarded so that separation via timing using fast photosensors possible

Enhanced sensitivity to broad physics program: solar neutrinos, (diffuse) supernova neutrinos, neutrinoless double beta decay (by isotope loading of scintillator)…

Acknowledgements