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Online calibration of neutrino liquid scintillator detectors above 10 MeV

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Online calibration of neutrino liquid scintillator detector at energies above 10 MeV is very important for study of such rare process as supernova and for correct calculation of backgrounds if spectral properties is the focus of researches. The traditional procedure implies the usage of radioactive sources with well-known spectral properties but such approach is limited by available radioactive sources, upper possible energies (˜10-11 MeV) and dangerous for ultra low background environment of modern detectors. The approach we propose is based on simulation of events with controllable UV double LED pulser. The LED's main wavelength fits the scintillator excitation wavelength. This technique allows to simulate physical events within the detector in very wide energy range from a few hundred keV to about 50 MeV. Additional studies like pile-up analysis can be performed due to double-LEDs scheme which generates two delayed signals with different adjustable amplitudes. The delay time is also adjustable parameter.

Presentation type

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