



LNGS SEMINARS

Maxim Gromov

Lomonosov Moscow State University

Skobeltsyn Institute of Nuclear Physics (MSU SINP)

Imitation of the inverse beta-decay reaction in the neutrino scintillator detectors with the controllable UV/visible LED flasher

Abstract

A new calibration system for the neutrino scintillator detectors has been developed. The instrument consists of a fast double output flasher which can be configured and controlled via USB, the appropriate application software. UV, visible or combination of both LEDs can be installed. Flashes amplitude, repetition rate and delay time between two continuous pulses are adjustable. High -OH silica fibers are used to minimize intensity losses on the delivery path. X-shape splitter is applied to combine two LED's pigtailed output and then to split the sum of the signals. One output feeds calibration path to the detector, while the second is used for pulse-to-pulse measurement of the flash intensity with a side-on PMT in combination with a flash ADC. The instrument allows to simulate point-like physical events in very wide energy range from a few hundred keV up to several dozen of MeV in the neutrino scintillator detectors, e.g. Borexino and JUNO. Thanks to the double-LEDs scheme and special plugins for the device management program, one can imitate the inverse beta-decay reaction specifying the spectra of the prompt and delayed events. Other double coincidences like pile-up events can be simulated as well.

June 7, 2018 - h 2:30 pm

LNGS - "B. Pontecorvo" room

http://agenda.infn.it/event/gromov_2018