

Clone of XIX International Workshop on Neutrino Telescopes



Contribution ID: 78

Type: Parallel Flash talk

Calibrating the world's largest LArTPC detector

Friday, 26 February 2021 11:40 (5 minutes)

The Deep Underground Neutrino Experiment (DUNE) is the next generation long-baseline experiment for neutrino physics. DUNE will measure the oscillation probabilities of neutrinos and antineutrinos at unprecedented precision to quantify the Charge-Parity (CP) violation effects in the leptonic sector and shed light on the matter-antimatter asymmetry in the universe along with supernovae, solar neutrinos and beyond standard model searches.

An ambitious scientific programme for the largest LArTPC detectors ever built, such as the DUNE Far Detector (FD) modules, requires outstanding detector performance and measurement precision. In particular, the DUNE Ionization Laser System (IoLS) will provide independent fine-grained measurements of detector parameters and help diagnose the detector to achieve the needed spatial resolution and energy response of the detector.

In this talk, I will introduce the calibration needs for the DUNE-FD and provide an overview of the external calibration systems planned in order to achieve the physics goals of DUNE. I will briefly talk about the status of various calibration systems with a focus on the DUNE-IoLS and present the latest updates.

Collaboration name

DUNE

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Session Classification: New Facilities