

Development of an Argon Light Source as a Calibration and Quality Control Device for Liquid Argon Light Detectors

Tuesday, May 25, 2021 5:12 AM (18 minutes)

The majority of future large-scale neutrino and dark matter experiments are based on liquid argon detectors. Since liquid argon is also a very effective scintillator, these experiments also have light detection systems. The fact that none of the existing photodetectors alone is sensitive to the liquid argon scintillation wavelength of 127 nm leads to the development of specialized light detectors, mostly based on wavelength shifters. The effective calibration and quality control of these newly developed detectors is still a persisting problem.

In order to respond to this need, we developed an argon light source which is based on plasma generation and light transfer across a MgF₂ window. The light source is designed as a small, portable and easy to operate device to enable the acquisition of performance characteristics of several square meters of light detectors. Here we will report on the development of the light source and its performance characteristics.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

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Session Classification: Sensor Posters: Light-based Detectors

Track Classification: Sensors: Sensors: Light-based detectors