



Contribution ID: 146

Type: **not specified**

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

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 liquid argon scintillation wavelength of 127 nm is most commonly shifted to the visible range by special wavelength shifters, or read out by the 127 nm sensitive photodetectors that are under development. The effective calibration and quality control of these active media 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 MgF_2 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.

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