

LArRI: a new setup for Liquid Argon Refractive index measurement

Friday 19 July 2024 18:00 (15 minutes)

Liquid argon, widely used as active target in neutrino and dark matter experiments, is a scintillator with a light yield of about 40 photons/keV, attenuation length of the order of meters and a scintillation peak at 128 nm. Adding small amounts of xenon (around 10 ppb) allows to shift this to 178 nm without spoiling the light yield. The longer wavelength simplifies the development of imaging systems. A precise knowledge of liquid argon optical properties in the VUV range is essential to improve the performance of liquid argon based experiments. Besides, the refractive index is a crucial parameter for the development of imaging systems. LArRI (Liquid Argon Refractive Index) aims at a direct measurement of liquid argon refractive index in the VUV spectrum using an interferometric technique that compares two interference patterns, created in vacuum and in liquid. Here we present our first results in liquid argon and liquid nitrogen extracted with a mercury lamp emitting at 254 and 184 nm.

Alternate track

1. Astro-particle Physics and Cosmology

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