

Optical readout of large scale dual-phase liquid Argon TPCs with the ARIADNE technology

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Optical readout of large scale dual-phase liquid Argon TPCs is an attractive and cost effective alternative to charge readout. Following the successful demonstration of 3D optical readout with the ARIADNE 1-ton detector, the ARIADNE+ experiment was deployed using the protoDUNE “cold box” at the CERN neutrino platform imaging a much larger active region of 2mx2m. ARIADNE+ uses 4 Timepix3 cameras imaging the S2 light produced by 16 novel glass THGEMs. ARIADNE+ takes advantage of the raw Timepix3 data coming natively 3D and zero suppressed with a 1.6 ns timing resolution. Cosmic muon events were recorded successfully at stable conditions providing the first demonstration for its use in kton scale experiments such as DUNE. Following these successful results, a proposal to instrument NP02 ProtoDUNE cryostat is in preparation and the design is advancing.

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