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Nota di contenuto	Introduction -- The liquid argon time projection chamber -- The ARGONTUBE detector -- Regeneration system for argon puriers -- The Greinacher high-voltage generator -- Realization of a GPU-based track nder -- Study of cosmic muon events -- UV laser methods and measurements -- Conclusions.
Sommario/riassunto	Michael Schenk evaluates new technologies and methods, such as cryogenic read-out electronics and a UV laser system, developed to optimise the performance of large liquid argon time projection chambers (LArTPC). Amongst others, the author studies the uniformity of the electric field produced by a Greinacher high-voltage generator operating at cryogenic temperatures, measures the linear energy transfer (LET) of muons and the longitudinal diffusion coefficient of

electrons in liquid argon. The results are obtained by analysing events induced by cosmic-ray muons and UV laser beams. The studies are carried out with ARGONTUBE, a prototype LArTPC in operation at the University of Bern, Switzerland, designed to investigate the feasibility of drift distances of up to five metres for electrons in liquid argon. Contents The ARGONTUBE detector The Greinacher high-voltage generator Linear energy transfer of muons in liquid argon UV laser methods and measurements Target Groups Lecturers and students of applied physics specialising in particle detector technologies Researchers developing liquid argon time projection chambers for rare event detection, e.g. in the field of neutrino physics or astrophysics About the Author Michael Schenk obtained his master’s degree in Applied / Experimental Physics from the University of Bern, Switzerland, and is currently doing an internship at CERN, Geneva, Switzerland in the fields of collective effects and beam instabilities in particle accelerators.