

Development of Low Temperature Analog Readout (LTARS 2018) for LAr-TPC

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We currently developed a new front-end electronics for a liquid argon time projection chamber (LAr-TPC) detector, which has been developed for neutrino oscillation and nuclear decay search experiments.

We developed the electronics (LTARS 2018) to have a wide dynamic range for input charge up to 1600 fC and a function to output a signal with an appropriate time constant for signals having various peaking times. These unique properties may make the LTARS 2018 multi-purpose, for example, not only for LAr-TPC but also a negative-ion gas TPC for dark matter search.

In this paper we will report the evaluation test on the noise and charge signal conversion performance of LTARS2018 at room temperature and cryogenic temperatures and the results of cosmic ray measurement tests using the LTARS2018. In addition, we will discuss the design concept and characteristics of a new electronics(LTARS2020) that has been modified to improve performance in cryogenic environments.

TIPP2020 abstract resubmission?

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