

Performance of Photosensors in High Rate Environment for Gas Cherenkov Detector

Wednesday, May 26, 2021 9:30 AM (18 minutes)

The SoLID project at Jefferson Laboratory will use a light gas Cherenkov detector for electron identification as part of their trigger. Due to the very high luminosity of the proposed experiments, the expected single-photon background rate is exceptionally high. It is essential to validate the planned photosensors and readout electronics to determine the limits of these sensors and mitigate the risk of failure of the trigger. We report on a beam test results with a prototype telescopic Cherenkov device in a high-rate environment in Hall C at Jefferson Lab. Commercially available multi-anode photomultipliers (MaPMT) and low-cost large-area picosecond photodetectors (LAPPD) were tested with the JLab FADC250 modules for the data acquisition to assess their performance in such an environment. The beam test results demonstrate that MaPMT array and LAPPD performed successfully at an experimental rate up to 190 kHz/cm^2 .

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

This work was supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357

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Session Classification: Sensors: Light-based detectors

Track Classification: Sensors: Sensors: Light-based detectors