

Abstract Submitted
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Gain Evaluation of Micro-Channel-Plate Photomultipliers in the Upgraded High-B Test Facility at Jefferson Lab CORINNE BARBER, University of South Carolina, DIRC AT EIC COLLABORATION¹ — The High-B test facility at Thomas Jefferson National Accelerator Facility allows researchers to evaluate the gain of compact photon sensors, such as Micro-Channel-Plate Photomultipliers (MCP-PMTs), in magnetic fields up to 5 T. These ongoing studies support the development of a Detector of Internally Reflected Cherenkov light (DIRC) to be used in an Electron Ion Collider (EIC). Here, we present our summer 2015 activities to upgrade and improve the facility, and we show results for MCP-PMT gain changes in high B-fields. To monitor the light stability delivered to the MCP-PMTs being tested, we implemented a Silicon Photomultiplier (SiPM) in the setup and calibrated the ADC reading this sensor. A 405-nm Light-Emitting Diode (LED) housed in an optical tube compatible with neutral density filters was also installed. The filters provide an alternative way of reducing the light output of the LED to operate the MCP-PMTs in a single-photon mode. We calibrated a set of filters by means of a photodiode and measured the photon flux at multiple positions relative to the LED. This information helped us to design 3D-printed holders unique to each MCP-PMT so that the photocathode receives the greatest amount of light. The improvements to the setup allow for more precise PMT gain evaluation.

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