

Abstract Submitted
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Experimental Setup for Magnetic-Field Tests of Small-Size Light Sensors at Jefferson Lab CAMERON NICKLE, University of South Carolina — In preparation for the Electron Ion Collider, small-size sensors, such as Silicon photo-multipliers (SiPM) and Multi-Channel Plate (MCP) photo-multipliers are being considered for use in a Detection of Internally Reflected Cherenkov Light (DIRC) detector. Since DIRC will be operated in the strong field of a magnetic spectrometer, the gain of the sensors must be evaluated in high magnetic fields. A dedicated test facility, which makes use of a solenoid magnet with magnetic fields of up to 4.7 T, is being developed at Jefferson Labs. This paper describes the configuration and operation of an entirely non-magnetic dark box that will house the sensors during the tests and allows the sensors to be rotated about two axes relative to the field. This paper also describes the development of a ROOT-based analysis method to extract the gain of SiPMs from raw Analog-to-Digital-Converter (ADC) spectra as a function of the intensity of the magnetic field and the sensor's relative to angle to the field. The dark box and analysis method was tested with Hamamatsu multipixel SiPMs and our results are consistent with previous measurements of the same sensors. The methodology developed in this work will be routinely used for the upcoming high-B field tests.

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