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Characterization of Multianode Photomultiplier Tubes for a Cherenkov Detector[1] MORGEN BENNINGHOFF, Duquesne University, MATTEO TURISINI, INFN, ANDREY KIM, Jefferson Lab, FATIHA BENMOKHTAR, Duquesne University, VALERY KUBAROVSKY, Jefferson Lab, DUQUESNE UNIVERSITY COLLABORATION, JEFFERSON LAB COLLABORATION — In the Fall of 2017, Jefferson Lab's CLAS12 (CEBAF Large Acceptance Spectrometer) detector is expecting the addition of a RICH (ring imaging Cherenkov) detector which will allow enhanced particle identification in the momentum range of 3 to 8 GeV/c. RICH detectors measure the velocity of charged particles through the detection of produced Cherenkov radiation and the reconstruction of the angle of emission. The emitted Cherenkov photons are detected by a triangular-shaped grid of 391 multianode photomultiplier tubes (MAPMTs) made by Hamamatsu. The custom readout electronics consist of MAROC (multianode read out chip) boards controlled by FPGA (Field Programmable Gate Array) boards, and adapters used to connect the MAROC boards and MAPMTs. The focus of this project is the characterization of the MAPMTs with the new front end electronics. To perform these tests, a black box setup with a picosecond diode laser was constructed with low and high voltage supplies. A highly automated procedure was developed to acquire data at different combinations of high voltage values, light intensities and readout electronics settings. Future work involves using the collected data in calibration procedures and analyzing that data to resolve the best location for each MAPMT.

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