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Improving UV-glass PMTs with a p-Terphenyl Wavelength Shifter SYLVESTER JOOSTEN, ZEIN-EDDINE MEZIANI, ED KACZANOWICZ, MELANIE REHFUSS, BURCU DURAN, MICHAEL PAOLONE, Temple Univ — UV-glass PMTs are often the limiting factor in a Cherenkov detector, due to their poor quantum efficiency (QE) below 300nm due to the UV-glass transparency. The application of a p-Terphenyl wavelength shifter to the face of these PMTs dramatically improves the QE for short wavelengths, rivaling that of a much more expensive quartz PMT. This is especially interesting in the context of multi-anode (MA) PMTs, which are supremely suited for application in future open-environment Cherenkov detectors at very high luminosities due to their small size, lower sensitivity to magnetic fields, and high potential for advanced background rejection. This will become critical at Jefferson Lab entering the 12 GeV era, as well as for a future electron-ion collider. We will discuss the process of coating the PMTs through vacuum evaporation, and the performance testing taking place at Temple University for these multi-anode PMTs, as well as the results obtained with the more traditional 5-inch PMTs that were coated for the low-threshold Cherenkov counter (LTCC) of the CLAS12 spectrometer at Jefferson Lab.

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