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Development of a Detector Prototype for future High Energy Gamma Ray Experiments[1] BRANDON WEINDORF, AEOWYN KENDALL, AL MOKRIS, ABAZ KRYEMADHI, MATTHEW FARRAR, Messiah University
— Development of instruments capable of detecting gamma rays across vast ranges of energies is important for understanding different astrophysical objects. Instruments are constrained by cost, power, autonomous operation and sensitivity over wide range of energies. Photomultiplier tubes have been the main photon detection technology for these experiments because they can be manufactured in large sizes hence higher light yields. The drawbacks of these devices is their higher voltage of operation, bulky size, and a limited number of vendors producing them. Silicon photomultipliers (SiPMs) are the solid-state equivalents which operate at lower voltage and there is an increase in the number of vendors producing them. The main drawbacks of SiPMs is their small surface area and higher dark rate. In order to circumvent their small area we have constructed a Cherenkov detector prototype with wavelength shifters (WLS) in combination with SiPMs to increase light collection efficiency and report on the detector performance.

[1]NASA PA Space Grant Consortium

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