

Abstract Submitted
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Investigation of Avalanche Photodiodes and Multipixel Photon Counters as Light Detectors for Cosmic Rays JAIME VASQUEZ, ARTHUR SAAVEDRA, ROXANA RAMOS, PABLO TAVARES, MARCUS WADE, SEWAN FAN, BROOKE HAAG, Hartnell College — Through the Research Scholars Institute, students of Hartnell Community College experimented with the application of avalanche photodiodes (APDs) as cosmic ray detectors during the summer of 2012. An APD detector was coupled with a 10 meter long wavelength shifting fiber (WSF) wrapped around a cylindrical plastic scintillator to maximize signal detection. A photomultiplier tube (PMT) was used in conjunction to detect the same scintillation light caused by incoming cosmic rays. Two APD detectors were evaluated to confirm the viability of the setup. In addition, a similar setup was recently utilized to implement multi-pixel photon counters (MPPCs) as readout detectors. Under this configuration, a high gain preamplifier was used to amplify the signals for both the MPPC and APD detectors. We report on our results characterizing the MPPC and discuss its overall performance. Compared to the APD, our findings suggest that the MPPC detector has greater sensitivity in detecting weak light signals, and can be used in place of the PMT for certain counting applications.

Brooke Haag
Hartnell College

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