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Characterization of Silicon Photomultiplier Detectors using Cosmic Radiation[1] FAVIAN ZAVALA, JUAN CASTRO, REXAVALMAR NIDUAZA, ZACHARY WEDEL, SEWAN FAN, Hartnell College, STEFAN RITT, Paul Scherrer Institute, LAURA FATUZZO, Hartnell College — The silicon photomultiplier light detector has gained a lot of attention lately in fields such as particle physics, astrophysics, and medical physics. Its popularity stems from its lower cost, compact size, insensitivity to magnetic fields, and its excellent ability to distinguish a quantized number of photons. They are normally operated at room temperature and biased above their breakdown voltages. As such, they may also exhibit properties that may hinder their optimal operation which include a thermally induced high dark count rate, after pulse effects, and cross talk from photons in nearby pixels. At this poster session, we describe our data analysis and our endeavor to characterize the multipixel photon counter (MPPC) detectors from Hamamatsu under different bias voltages and temperature conditions. Particularly, we describe our setup which uses cosmic rays to induce scintillation light delivered to the detector by wavelength shifting optical fibers and the use of a fast 1GHz waveform sampler, the domino ring sampler (DRS4) digitizer board.

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