

Abstract Submitted
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A Compact Cosmic Ray Telescope using Silicon Photomultipliers for use in High Schools¹ LUIS CASTRO², LEONARDO ELIZONDO, MARK SHELOR, OMAR CERVANTES, SEWAN FAN, Hartnell College, STEFAN RITT, Paul Scherrer Institut — Over the years, the QuarkNet and the LBL Cosmic Ray Project have helped trained thousands of high school students and teachers to explore cosmic ray physics. To get high school students in the Salinas, CA area also excited about cosmic rays, we constructed a cosmic ray telescope as a physics outreach apparatus. Our apparatus includes a pair of plastic scintillators coupled to silicon photomultipliers (SiPM) and a coincidence circuit board. We designed and constructed custom circuit boards for mounting the SiPM detectors, the high voltage power supplies and coincidence AND circuit. The AND logic signals can be used for triggering data acquisition devices including an oscilloscope, a waveform digitizer or an Arduino microcontroller. To properly route the circuit wire traces, the circuit boards were layout in Eagle and fabricated in-house using a circuit board maker from LPKF LASER, model Protomat E33. We used a Raspberry Pi computer to control a fast waveform sampler, the DRS4 to digitize the SiPM signal waveforms. The CERN PAW software package was used to analyze the amplitude and time distributions of SiPM detector signals. At this conference, we present our SiPM experimental setup, circuit board fabrication procedures and the data analysis work flow.

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