

Abstract Submitted
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Silicon Photomultiplier and Scintillator Bar Systems¹ MARK SHELOR, LEONARDO ELIZONDO, Hartnell Community College, STEFAN RITT, Paul Scherrer Institute, Switzerland — To analyze extraterrestrial cosmic rays via precise measurements of airshower axes directions of penetrating particles such as muons, we constructed a model detector consisting of two 1-meter long scintillator bars. Each bar is fitted with green wavelength shifting fibers to modulate input for two silicon photomultiplier (SiPM) light detectors to record light produced by cosmic rays via scintillation. The purpose of the experiment is to determine the performance of these devices. Two makes of SiPMs were evaluated – from AdvanSiD and Hamamatsu. In order to filter out noise, timing measurements of the apparatus were performed under several trigger conditions such as coincidence trigger with 2 photomultiplier detectors, as well as SiPM detector arrays in self-triggered mode. The DRS4 Digitizer 4-channel fast waveform sampler digitized SiPM detector waveforms. Signals were analyzed with the CERN PAW package. The speed of light in the scintillator using the SiPM modules was found to be approximately 66% of the speed of light in a vacuum which is in accordance with the index of refraction for the fibers given by the manufacturer’s specifications. The results of our timing measurements would be presented.

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