

Abstract Submitted
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Timing Measurements of Scintillator Bars with Silicon Photomultiplier Light Detectors MARK SHELOR, LEONARDO ELIZONDO, Hartnell Community College, STEFAN RIIT, Paul Scherrer Institute, Switzerland, MARK SHELOR AND LEONARDO ELIZONDO TEAM¹ — To construct a cosmic ray tracker for precise measurements of particle airshower axes directions, we developed a prototype apparatus consisting of two 1 meter long scintillator bars. Each bar is embedded with green wavelength shifting fibers. At the two ends of the fibers are coupled silicon photomultiplier (SiPM) light detectors to record the scintillation light produced from energetic cosmic rays. We did extensive evaluation for two makes of SiPM devices using this apparatus. Our detectors include devices from AdvanSiD and from Hamamatsu. We performed timing measurements for the scintillator bars using several trigger conditions. The trigger conditions included: coincidence trigger with 2 photomultiplier detectors and SiPM detectors in self triggered mode. The SiPM detector waveforms were digitized using a 4 channel fast waveform sampler, the DRS4 digitizer. The signals were analyzed with the CERN PAW package. From our results, we deduced the speed of light in the scintillator to be about 66% of the speed light in vacuum. This is in accordance with the specifications of the index of refraction for the fibers given by the manufacturer's specifications. The results of our timing measurements would be presented.

¹We intend to present on Saturday October 31st.

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