Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Development of a Modern Cosmic Ray Telescope based on Silicon Photomultipliers for use in High Schools[1] DANIEL RUIZ CASTRUITA, ROMMEL NIDUAZA, VICTOR HERNANDEZ, ADRIAN KNOX, DANIEL RAMOS, SEWAN FAN, LAURA FATUZZO, Hartnell College — Lately, a new light sensor technology based on the breakdown phenomenon in the reverse biased silicon diode has found many applications that span from particle physics to medical imaging science. The silicon photomultiplier (SiPM) has several notable advantages compared to conventional photomultiplier tubes which include: lower cost, lower operating voltage and the ability to measure very weak light signals at the single photon level. At this conference meeting, we describe our efforts to implement SiPMs as read out light detectors for plastic scintillators in a cosmic ray telescope for use in high schools. In particular, we describe our work in designing, testing and assembling the cosmic ray telescope. We include a high gain preamplifier, a custom coincidence circuit using fast comparators to discriminate the SiPM signal amplitudes and a monovibrator IC for lengthening the singles and coincidence logic pulses. An Arduino micro-controller and program sketches are used for processing and storing the singles and coincidence counts data. Results from our measurements would be illustrated and presented.

[1]US Department of Education Title V grant award PO31S090007

Sewan Fan
Hartnell College

Date submitted: 08 Jan 2015 Electronic form version 1.4