

Abstract Submitted
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Implementing Xbee Wireless Network to Monitor Cosmic Ray Detectors ROMMEL NIDUAZA, Hartnell Community College — The silicon photomultiplier (SiPM) is a highly sensitive light detector capable of measuring very dim light and single photons. It is biased slightly above the breakdown voltage, which results in high gain that is also very sensitive to changes in temperature. At this conference, we describe our experiments in using the popular Xbee wireless transceivers as possible communication devices to remotely monitor the changes in temperature for the SiPM from Hamamatsu. The Xbee modules are paced in a mesh network and communicate from a distance to monitor the resistance from platinum temperature sensors, to be incorporated with the SiPM detectors. Our investigations include extensive evaluation of the Xbee units for readout of the platinum sensor voltages for digitizing the sensor signals using the Xbee's onboard 10bit ADC. We have successfully implemented a mesh network consisting of 4 Xbee modules placed at indoor settings and have tested the network communications for maximum range between 2 Xbee modules at outdoor settings as well. Moreover, we describe our data acquisition setup using a Raspberry Pi computer and custom made programs to analyze and receive the sensor data communicated between Xbee modules.

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