

Characterizing the Temperature Dependence of Silicon Photomultipliers and Scintillators

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Abstract: Silicon photomultipliers (SiPMs) are an attractive alternative to traditional photomultiplier tubes (PMTs) for use in radiation detection applications. The interest in recent years has piqued due to SiPM's small form factor, low operating voltage, magnetic field insensitivity and negligible cost differences compared to PMTs for comparable photo-sensitive area. The gain and dark current levels of SiPMs allow for detection applications in a variety of environments. Temperature plays a large role in the dark current produced in the device from the thermal production of charge carriers, impacting energy resolution and pulse shape discrimination in scintillator detectors. This presentation will investigate how temperature affects SiPM and scintillator performance.