

Abstract Submitted
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Solid State Photomultipliers for Nuclear and High Energy Experiment Applications. ERIK JOHNSON, Radiation Monitoring Devices, Inc., SKIP AUGUSTINE, Augustine Engineering, RADIA SIA, CHRISTOPHER STAPELS, JAMES CHRISTIAN, Radiation Monitoring Devices, Inc. — Solid-State Photomultipliers (SSPMs) are an array of photodiodes built on a common substrate. Each photodiode is operated in a Geiger mode, where a single photon could trigger a self-sustained avalanche. The avalanche is quenched either using passive quenching or active quenching circuits (both methods will be discussed). The avalanche provides a gain of $\sim 10^6$, which is comparable to existing photomultiplier tubes. Radiation Monitoring Devices has built SSPMs with CMOS processes, which allows for integrating signal processing and photon collection on one chip, allowing for a detector-on-a-chip design. A number chip designs will be presented showing the potential of these devices for various applications for nuclear and high-energy experiments.

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