

Abstract Submitted
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Cryogenic electronics control and characterization for dark matter detection JIALIN YU, RAKSHYA KHATIWADA, Illinois Institute of Technology, MOHAMED HASSAN, Fermilab, QISMET COLLABORATION — Axions are theoretically motivated ultralight cold-dark-matter (CDM) candidates. Superconducting qubits and quantum-noise limited amplifiers such as Traveling Wave Parametric Amplifier (TWPA) can be utilized to develop axion dark matter detectors. In the COVID era, we successfully set up a remote controlled system for characterizing TWPA which included detailed measurements of noise and parametric gain of two of these amplifiers. Furthermore, we designed PCB boards for a new dilution refrigerator infrastructure that will be utilized to study the effects of ambient and cosmic radiation in the qubits. Our results will be used to study qubits and develop qubit and quantum amplifiers based dark matter detectors.

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