

Abstract Submitted
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Superconducting RF Cavities for the Axion Dark Matter Experiment¹ THOMAS BRAINE, University of Washington, ADMX COLLABORATION — The Axion Dark Matter eXperiment (ADMX) searches for Axions, a dark matter candidate, by conversion to photons in a high magnetic field that are then detected within a resonant cavity. The rate that the detector scans potential axion masses (or photon frequency) is linear with the quality factor of the cavity. Though superconducting cavities can have several orders of magnitude higher quality factors than copper, they often degrade significantly in the high magnetic fields required for Axion detection. Recently, some superconductors have shown potential for quality factors greater than copper even in high magnetic fields. In this work, we present our progress on studying different materials, primarily Niobium, Nb₃Sn and NbTi. The materials are tested within cavities with varying purpose-built geometries, that can operate in a Physical Properties Measurement System, capable of fields up to 14 T and temperatures down to 2 K. This is part of the design studies for the next phase of ADMX covering the 2-4 GHz range.

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