

Abstract Submitted
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Results of a High-Frequency Resonant Cavity Design Study for ADMX¹ I. STERN, U. of Florida, ADMX COLLABORATION, ADMX-HF COLLABORATION — The Axion Dark Matter eXperiment (ADMX) has conducted axion searches in the mass range of 1.9–3.6 μeV (460–860 MHz). A design study for large volume high-frequency resonant cavities was performed to enable further exploration of axions at frequencies >1 GHz. Two frequency-increasing tuning techniques, photonic band-gap resonators and multi-vane tuning configurations, were investigated. Photonic band-gap resonators consist of an array of tuning posts in a regular pattern that are manipulated to vary the TM modes (the only modes that interact with the axion). The multi-vane tuning method rotates radially-oriented vanes to partition the cavity into regions which mimics the mode response of strongly coupled segmented cavities. The study compares the dynamic frequency tuning range, mode form factor, and cavity quality factor (Q) of various designs. Findings of the study will be presented.

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