Abstract Submitted
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High-Frequency Resonant Cavities for the Detection of Axion Dark Matter[1] I. STERN, A.A. CHISHOLM, J. HOSKINS, J. HWANG, C. MARTIN, P. SIKIVIE, N.S. SULLIVAN, D.B. TANNER, U. of Florida, C. BOUTAN, M. HOTZ, D. LYAPUSTIN, G. RYBKA, A. WAGNER, L.J. ROSENBERG, U. of Washington, S.J. ASZTALOS, G. CAROSI, C. HAGMANN, D. KINION, Lawrence Livermore National Laboratory, K. VAN BIBBER, Naval Postgraduate School, R. BRADLEY, National Radio Astronomy Observatory, J. CLARKE, U. of California, Berkeley, ADMX COLLABORATION — The axion is a plausible dark matter candidate. The Axion Dark Matter eXperiment (ADMX) has conducted axion searches in the mass range of 1.9 – 3.5 μeV (460 – 850 MHz). Next-generation cavity designs will enable the exploration of a significantly larger portion of the favored dark matter axion mass-coupling phase space. ADMX is researching higher resonant frequency cavity designs, with Q-factor and effective volume comparable to or greater than the current experiment. Current concepts include segmented resonators, tunable periodic arrays, and superconducting hybrid cavities. The segmented resonator divides the cavity into equal volume sections, and combines the power (in phase) of each section. The tunable periodic arrays can be manipulated within the cavity to vary the resonance modes at high frequencies. Superconducting hybrids will use thin-film superconducting walls to obtain significantly higher Q-factors. Recent advances and future plans for cavity research will be presented.

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I. Stern
U. of Florida

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