Contribution ID: **77** Type: **not specified**

Piezoelectric Tuning of Microwave Cavities for Axion Searches

Tuesday, 25 August 2015 16:10 (20 minutes)

The Axion Dark Matter eXperiment (ADMX) searches for dark-matter axions by looking for their resonant conversion to microwave photons in a strong magnetic field. In the event that ADMX rules out axions in the 500MHz - 2GHz frequency range, new technologies and cavity geometries will need to be explored to find higher mass axions. ADMX Sidecar is a higher frequency pathfinder experiment that uses a miniature resonant cavity to search for axions in the 3.5GHz-6GHz frequency range. The Sidecar cavity sits on top of the main ADMX cavity and relies greatly upon piezo motors for tuning and for antenna coupling. Here I discuss the progress of this experiment and give an update on our success with piezoelectric tuning/coupling.

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Session Classification: Microwave Cavity Motion Control