

ADMX Haloscope R&D

Wednesday 17 May 2017 11:15 (15 minutes)

The Axion Dark Matter eXperiment (ADMX) is a direct-detection axion dark matter search which has successfully completed searches between 1.9 and 3.7 μeV down to the KSVZ photon-coupling strength limit. The current upgrades will allow ADMX to detect axions with even the most pessimistic couplings in this frequency range. In order to expand the mass reach of the Haloscope detector, ADMX is conducting extensive research and development of microwave cavity technology. Multiple prototype development programs include periodic post arrays, multi-vane cavities, in-phase coupled cavities, partitioned cavities, superconducting hybrids, and exotic waveguide-like cavities. Additional studies include techniques for mode identification and mode-mixing suppression, as well as advanced simulations and optimization. The various projects are in different phases of analysis, fabrication, and/or testing. The current status, near term objectives, projected sensitivities, and theoretical considerations will be presented.

This work was supported by DOE Grants DOE grant DE-SC00098000, DOE grant DE-SC0011665, DE-AC52-07NA27344, DE-AC03-76SF00098, the Heising-Simons Foundation, and the Lawrence Livermore National Laboratory, Fermilab and Pacific Northwest National Laboratory LDRD programs. SQUID development was supported by DOE grant DE-AC02-05CH11231.

Primary author: STERN, Ian (University of Florida)

Presenter: STERN, Ian (University of Florida)

Session Classification: Session 10