Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Reaching the 5–9 μeV Range with ADMX: Multi-Cavity Array[1]
JIHEE YANG, Univ of Washington, ADMX COLLABORATION — Axions are particles that arise from the Peccei-Quinn solution to the strong charge-parity problem in quantum chromodynamics. Axions with a few μeV mass are a prominent cold dark matter (CDM) candidate. The aim of the Axion Dark Matter eXperiment (ADMX) is to detect CDM axions in the halo of our Galaxy. ADMX seeks to detect axions by observing the conversion of axions to microwave photons in a high-Q resonant cavity in a strong magnetic field (an Axion haloscope). ADMX recently has completed successfully a search over the 2.66–2.81 μeV mass range with unprecedented sensitivity. For higher mass range searches, ADMX has developed multi-cavity arrays as the heart of a haloscope for axion masses in the 5–9 μeV range. We will present design aspects and preliminary study results of a 4-cavity array prototype. We will also discuss the performance of a Pound locking method adapted to synchronize the resonant frequencies of the multiple cavities.

[1]Supported by U.S. DOE: Grants DE-SC0009723, DESC0010296, DE-SC0010280, DEFG02-97ER41029, DE-FG02-96ER40956, DEAC52-07NA27344, DE-AC03-76SF00098 and DE-AC02-07CH11359. Additional support by Heising-Simons Foundation and Fermilab, LLNL, and PNNL LDRD.

Jihee Yang
Univ of Washington

Date submitted: 12 Jan 2018 Electronic form version 1.4