Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Quantum Amplifiers for the ADMX experiment[1] GIANPAOLO CAROSI, Lawrence Livermore Natl Lab, ADMX COLLABORATION — The nature of dark matter is one of the largest open questions in particle physics and cosmology. One leading candidate is the axion particle, a light neutral pseudoscalar boson that would be produced in copious amounts in the early universe. Though extremely weakly interacting they may be detected by their conversion to photons in the microwave resonator immersed in a strong magnetic field. This is the basis of the Axion Dark Matter Experiment (ADMX) which recently completed its first data run at unprecedented sensitivity. This experiment was enabled by superconducting quantum amplifiers including the Microstrip SQUID amplifier (MSA) and the Josephson Parameteric Amplifier (JPA). Here I will describe how these amplifiers work and how they will be applied in ADMX moving forward.

[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.

Gianpaolo Carosi
Lawrence Livermore Natl Lab

Date submitted: 12 Jan 2018 Electronic form version 1.4