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Calibrating the DMRadio Axion Dark Matter Detectors

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The DMRadio program consists of a series of lumped element detectors searching for low mass, sub- μeV axion dark matter. The three DMRadio detectors will each be comprised of a superconducting magnet and pickup structure coupled to a high-Q tunable LC resonator. In this talk, I will outline the calibration plan these experiments will employ to determine their end-to-end sensitivity to axion dark matter. A variety of methods will be used, including a mimetic axion signal injected into the detector, resonator noise measurements, multichannel SQUID chain calibration, and sideband injection. These results will allow us to characterize lumped element detectors and convert raw detector data into limits on axion to two photon coupling.

Submitted on behalf of a Collaboration?

Yes

Author: FRY, Jessica (Massachusetts Institute of Technology)

Presenter: FRY, Jessica (Massachusetts Institute of Technology)

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