

DM Radio: An Optimized Resonant Search for Axion and Hidden-Photon Dark Matter

Tuesday, 29 May 2018 17:10 (20 minutes)

We discuss DM Radio, a lumped-LC resonant search for axion and hidden-photon dark matter between 100 Hz and 300 MHz. We illustrate the detection concept and discuss design and fabrication of the Pilot detector, which will operate in liquid helium at 4 K over the next three years and probe hidden photons in a portion of this frequency range. We show results from a fixed-frequency resonator and present work on detector characterization, including a study of loss mechanisms, shielding performance, and dc SQUID amplifier noise. We discuss future plans to optimize DM Radio, in the context of fundamental limitations on electromagnetic searches for light-field dark matter.

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Funding source

Heising-Simons Foundation, Kavli Institute for Particle Astrophysics and Cosmology, SLAC Laboratory Directed Research and Development

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Session Classification: Dark Matter

Track Classification: DM