

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

Tuesday, May 29, 2018 5:10 PM (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.

E-mail

schaudh2@stanford.edu

Funding source

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

Primary author: Mr CHAUDHURI, Saptarshi (Stanford University)

Co-authors: Dr PHIPPS, Arran (Stanford University); Mr DAWSON, Carl (Stanford University); Dr LI, Dale (SLAC National Accelerator Laboratory); Dr CHO, Hsiao-Mei (SLAC National Accelerator Laboratory); Prof. IRWIN, Kent (Stanford University); Prof. GRAHAM, Peter (Stanford University); Mr KUENSTNER, Stephen (Stanford University); Prof. RAJENDRAN, Surjeet (University of California, Berkeley)

Presenter: Mr CHAUDHURI, Saptarshi (Stanford University)

Session Classification: Dark Matter

Track Classification: DM