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

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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

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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)

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