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BREAD: Broadband Reflector Experiment for Axion Detection

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We present a novel dish antenna for broadband \sim meV-eV range axion and wave-dark matter detection, which allows to utilize state-of-the-art high-field solenoidal magnets. At these masses it is difficult to scale up traditional resonator setups to the required volume. However, at metallic surfaces in a high magnetic field dark matter axions can convert to photons regardless of axion mass. These photons can be successively focused onto a detector (dish antenna concept). In this talk we present progress on BREAD, a dish antenna using a $\sim 10 \text{ m}^2$ conversion area with a novel rotationally symmetric parabolic focusing reflector designed to take advantage of high-field solenoidal magnets. We discuss viable low-noise photon detectors and show progress towards smaller first stage hidden photon experiments with expected sensitivity to unexplored hidden photon couplings. We estimate sensitivities for future large-scale experiments.

Speaker

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