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First test of a photonic band gap structure for ADMX-HF

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Haloscopic axion searches require the tuning of a TM mode in a microwave cavity. Traditional cavities contain many unwanted modes which can result in mode crossings, ultimately reducing the effective tuning range of a cavity and slowing scan rates. Photonic band gap (PBG) structures have the potential to create resonators without TE modes, allowing for uninterrupted tuning. A tunable PBG structure has been designed for ADMX-HF. A prototype has been built and tested to validate simulations. Results of the fixed frequency case will be shown as well as details of the expected tuning.

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Primary author: LEWIS, Samantha (University of California - Berkeley)

Presenter: LEWIS, Samantha (University of California - Berkeley)