

Abstract Submitted
for the FWS19 Meeting of
The American Physical Society

Axionic Dark Matter Search: Status of HAYSTAC¹ HEATHER JACKSON, UC Berkeley, HAYSTAC COLLABORATION — Haloscope at Yale Sensitive To Axion Cold Dark Matter (HAYSTAC) serves as both a data pathfinder and an innovation test-bed for new technologies in searching for the axion, a leading dark matter candidate. Because axionic dark matter interacts with baryonic matter extremely weakly, HAYSTAC employs a strong magnet and a tunable microwave cavity to enhance the interaction of axions with virtual photons, thus resulting in a miniscule power deposition. HAYSTAC strives to increase the signal to noise ratio by using a dilution refrigerator and advanced amplifier technology/techniques. HAYSTAC - Phase I used a Josephson parametric amplifier to reduce noise to a near-quantum level and exclude axion models in the range 23.15 - 24.0 micro-eV. As HAYSTAC enters Phase II, I will discuss the current state of the experiment which uses recent developments in quantum measurement technology to circumvent the standard quantum limit, i.e. squeezed states, as well as future plans to improve cavity design.

¹This work is supported by National Science Foundation grant 1607417.

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Date submitted: 27 Sep 2019

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