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Results from a microwave cavity axion search with Phase 1 of the HAYSTAC Experiment[1] KELLY BACKES, Yale Univ, HAYSTAC COLLABORATION — The axion is a well-motivated dark matter candidate that was first proposed as a solution to the strong CP problem. HAYSTAC is a dark matter axion experiment designed to detect cosmic axions through their conversion into photons using a high Q microwave cavity detector. The platform is small but flexible to facilitate the development of new microwave cavity and amplifier concepts in an operational environment, and is the first to explore the axion model band above 10 μeV. I will discuss improvements made to the experiment between data runs one and two, and report on the results from the first phase of the experiment, covering the range 5.6–5.8 GHz ($23.15 < m_a < 24.0\,\mu$eV). We exclude axion models in this mass range with two photon coupling at $g_{\alpha\gamma\gamma}$ $2 \times 10^{-14}\,\mathrm{GeV}^{-1}$, which is in the upper range of the KSVZ model band. The experiment is now being upgraded with a squeezed-vacuum state receiver to improve the sensitivity and scan speed of the search.

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