

Completion of Phase I and Preparation for Phase II of the HAYSTAC Experiment

Thursday 21 June 2018 12:30 (20 minutes)

The Haloscope At Yale Sensitive To Axion CDM (HAYSTAC) utilizes a tunable resonant microwave cavity to search for dark matter axions. In this talk, we will present an overview of the operational details and results from Phase I of the HAYSTAC experiment. This phase relied on a 9.4 T magnet, Josephson parametric amplifiers, and a dilution refrigerator for the operation of the experiment. Axion models with two photon coupling $g_{a\gamma\gamma} \geq 2 \times 10^{-14} \text{ GeV}^{-1}$ were excluded in the $23.15 < m_a < 24.0 \mu\text{eV}$ mass range. Improvements for Phase II of the experiment will also be presented, which include upgrades to the cryogenics system, a new squeezed-state receiver system. Finally, work on multi-rod cavities and photonic band gap resonators for higher frequency operation will be discussed.

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