

The ALPHA axion dark matter experiment

Thursday 18 July 2024 08:30 (17 minutes)

The axion represents a well-motivated dark matter candidate with a relatively unexplored range of viable masses. Recent calculations argue for post-inflation axion mass ranges corresponding to frequencies of roughly 10-100 GHz. These frequency ranges offer challenges for the traditional cavity haloscope which can be overcome through the use of metamaterial resonators that fill large volumes. The ALPHA (Axion Longitudinal Plasma HALoscope) experiment, located at Yale University, is an axion dark matter detector probing the 10-45 GHz frequency range. Axions can convert into photons in the tunable and cryogenically-cooled resonator within the 16-T magnet of the experiment, and be detected with the quantum-limited amplification and read-out. In this talk, we will describe the general design parameters of the experiment and the expected sensitivity.

Alternate track

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Yes

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