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ADMX Results on Axion Searches

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I present a progress report on the direct search for dark matter axions with ADMX upgraded with low noise RF SQUID amplifiers and cryogenics. Axions are a well motivated candidate to explain the discrepancy between the observed baryonic matter density and that inferred from precision measurements of the microwave background anisotropy, gravitational lensing, and the dynamics of spiral galaxies. As a pseudo-Goldstone boson associated with spontaneous breaking of the PQ symmetry, axions gain further credibility from the Higgs discovery. The ADMX experiment utilises a cryogenic tuneable electromagnetic resonator immersed in a static magnetic field to search for axions at micro electron volt scales. The axion field undergoes Primakov conversion into microwave photons when the frequency of a TM resonance of the cavity corresponds to the energy per axion. Background originates from the physical cavity temperature added to the effective noise temperature of the receiver electronics. By reducing the temperature of the axion receiver, we aim for an improved rate of search of the allowed window of axion masses.

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