

Abstract Submitted  
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**Searching for Axion Dark Matter With the South Pole Telescope**

KYLE FERGUSON, University of California, Los Angeles, SOUTH POLE TELESCOPE COLLABORATION — Axions and axion-like particles with masses ranging from  $10^{-22}$  to  $10^{-2}$  eV are compelling dark matter candidates. As shown by Fedderke et al., coupling between axions and photons induces a characteristic birefringence that oscillates in time, mixing the Q and U Stokes parameters of the cosmic microwave background (CMB) in-phase across the entire sky. A search for this novel signature is expected to yield results that are competitive with existing constraints in the mass range of  $10^{-22}$  to  $10^{-18}$  eV. We search for this oscillation using data from SPT-3G, a CMB camera on the 10-m South Pole Telescope that surveys the sky at 90, 150, and 220 GHz. SPT-3G is an ideal instrument with which to carry out this search, as its arcminute resolution allows it to see most of the power in the E-mode spectrum. Additionally, SPT-3G's strategy of observing the same patch of sky multiple times a day for many consecutive years enables detection of relative changes on timescales as short as a day or as long as a year. In this talk I will outline our search strategy as well as our projected sensitivity to the signal.

Kyle Ferguson  
University of California, Los Angeles

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