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Title: Searching for Axion Dark Matter With the South Pole Telescope

Abstract: Axions and other axion-like particles (ALPs) remain compelling dark matter candidates with a wealth of possible detection methods. A photon traveling through an axion field will experience a rotation in its polarization proportional to the difference in axion field value at photon emission and photon absorption. Thus the apparent polarization of a static astrophysical source will oscillate in time as the local axion dark matter field oscillates (with a frequency proportional to the axion mass). The cosmic microwave background (CMB) is polarized, well-studied, and extremely static, making it an ideal source with which to search for this effect. I will discuss the analysis procedure and results of such a search for ultra-light ALPs with masses roughly between  $10^{-21}$  eV and  $10^{-19}$  eV using data from the South Pole Telescope (SPT), a millimeter-band telescope with arcminute resolution that is located at the geographic South Pole and designed to observe the CMB.