

Searching For Axion Dark Matter with the South Pole Telescope

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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. We present the status of such a search for ultra-light ALPs with masses roughly between 10^{-21} 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.

Reference to paper (DOI or arXiv)

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