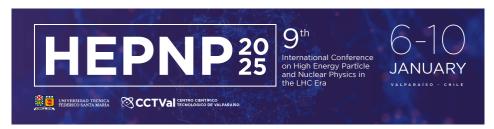
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Axion-Induced Patchy Screening of the CMB

Wednesday 8 January 2025 11:20 (35 minutes)

Cosmic Microwave Background (CMB) photons can undergo resonant conversion into axions in the presence of magnetized plasma distributed inside non-linear Large-Scale Structure (LSS). This process leads to axion-induced patchy screening: secondary temperature and polarization anisotropies with a characteristic non-blackbody frequency dependence that are strongly correlated with the distribution of LSS along our past light cone. First, I will discuss the modeling and computation of the axion signal contribution to different correlation functions, involving both CMB and and LSS observables. I will then show that a search using Planck temperature maps cross-correlated with the unWISE galaxy catalogue is already competitive to the most sensitive existing astrophysical axion searches, for axion masses around a few times 10⁻¹³ eV. Observations from future surveys could extend this reach by almost an additional order of magnitude.

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