

# 9th International Conference on High Energy Particle and Nuclear Physics in the LHC Era



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## Axion-Induced Patchy Screening of the CMB

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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 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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