

LNGS SEMINAR SERIES

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CMB constraints on mass and coupling constant of light pseudoscalar particles

Transformation of the CMB photons into light pseudo-scalar particles at the post big bang nucleosynthesis epoch is considered. Using the present day value of large scale magnetic fields to estimate it at earlier cosmological epochs, we calculate the oscillation probability of the photons into light pseudo-scalar particles with an account of the coherence breaking in the cosmological plasma. Demanding that the process of the photon transformation does not lead to an exceedingly large CMB temperature anisotropy, we further constrain the coupling of axion like particles to photons. Our results differ from the previously obtained ones since we use the density matrix method which is more accurate than the wave function approximation for the description of the oscillations with an essential coherence breaking.

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