

Phenomenology 2021 Symposium



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CMB birefringence due to ultra-light axion strings

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Ultralight axions (ULA), whose masses can lie in a wide range of values and can be even smaller than 10^{-28} eV, are generically predicted in UV theories such as string theory. In the cosmological context, the early Universe may have gotten filled with a network of ultralight axion (ULA) cosmic strings which, depending upon the mass of the axion, can survive till very late times. If the ULA also couples to electromagnetism, and the network survives post recombination, then the interaction between the strings and the CMB photons induces a rotation of the polarization axis of the CMB photons (otherwise known as the birefringence effect). This effect is independent of the string tension, and only depends on the coupling between the ULA and the photon (which in turn is sensitive to UV physics). In this talk I will present some results for this birefringence effect on CMB, due to three different models of string network. Interestingly, this is within the reach of some current and future CMB experiments.

Summary

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