

Isotropic and anisotropic cosmic birefringence by axion domain walls - Theory Talk

Tuesday, 14 May 2024 15:30 (1 hour)

The isotropic cosmic birefringence with a rotation angle of about 0.3 degrees has been suggested by the recent analysis of the CMB polarization data. The suggested rotation angle is tantalizingly close to the angle determined by the fine structure constant, $1/137$ radians = 0.42 degrees. I will show that axion domain walls coupled to QED can naturally explain this coincidence for a wide range of axion masses and axion-photon couplings. Furthermore, the axion domain walls predict a characteristic anisotropic cosmic birefringence, which can be investigated by future observations and will tell us about the initial state of the axion fluctuations in the very early universe.

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