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$n\pi$ ambiguity of cosmic birefringence and its effect on ALP search

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Recently, several papers have reported so-called ‘Cosmic birefringence’, which is a rotation of the direction of linear polarization of CMB. This might be a hint of new physics beyond standard models because the signal means large scale parity violation of this universe. The reported angles of the rotation are ~ 0.3 deg. However, we point out there is a $n\pi$ phase ambiguity for the angle. This ambiguity is trivial from the observational method to determine the angle, but has not been discussed seriously so far though it can impact on the origin of cosmic birefringence. We also discuss how to constrain the ambiguity.

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