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B-modes from Post-inflationary Gravitational Waves Sourced by Axionic Instabilities at Cosmic Reionization

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We show that axion-like particles that the only couple to invisible dark photons can generate visible B-mode signals around the reionization epoch. The axion field starts rolling shortly before reionization, resulting in a tachyonic instability for the dark photons. This generates an exponential growth of the dark photon quanta sourcing both scalar metric modes and gravitational waves that leave an imprint on the reionized baryons. The tensor modes modify the cosmic microwave background (CMB) polarization at reionization, generating visible B-mode signatures for the next generation of CMB experiments for parameter ranges that satisfy the current experimental constraints.

Summary

Author: LU, Sida (University of Wisconsin-Madison)

Presenter: LU, Sida (University of Wisconsin-Madison)

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