



Contribution ID: 156

Type: **not specified**

Probing Axion Inflation via Gravitational-Wave Production

Wednesday 28 May 2025 14:40 (20 minutes)

Axion inflation is an extension of the slow-roll paradigm featuring helical gauge-field production with possible consequences for inflationary magnetogenesis, leptogenesis, reheating, and gravitational wave production. I focus on the latter, studying the detectability of gauge-field-induced gravitational waves from axion inflation. For this, I consider two models: the first featuring a „sterile“ gauge field, which does not couple to any scalars of fermions, and a more realistic model, where the gauge field in question is the standard-model hypercharge field. The coupling to standard model fermions allows for efficient fermion production via the Schwinger mechanism, drawing energy from the gauge fields and thus impacting the gravitational-wave spectrum.

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Session Classification: Gravitational Waves