

Abstract Submitted  
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**Phenomenology of Fermion Production During Axion Inflation**

LAUREN PEARCE, Pennsylvania State University- New Kensington — While the production of bosons during inflation has received substantial attention, the production of fermions has been comparatively neglected. Although they cannot be produced resonantly, fermions can be produced during axion (pseudoscalar) inflation through a derivative coupling. Despite the lack of resonant enhancement, fermions can have phenomenologically interesting consequences. In particular, the cosmic microwave background (CMB) power spectrum fluctuations can be dominated by the sourced contribution from this fermion production, with the familiar vacuum fluctuations subdominant. Unlike in bosonic production, this scenario satisfies non-Gaussianity constraints, in addition to being consistent with the measured spectral tilt. Therefore, this scenario is consistent with all observational data, and we cannot say with confidence whether the observed CMB fluctuations are sourced or vacuum fluctuations. Implications for primordial gravitational waves will also be discussed.

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