Preprint Series in Particles and Cosmos Physics

nº IPARCOS-UCM-26-034

INSTITUTO DE FÍSICA
DE PARTÍCULAS Y DEL COSMOS

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Renormalization effects fade away during inflation

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June 2026

Plaza de las Ciencias, 1 28040 Madrid, Spain

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Abstract

The renormalization of the primordial inflationary power spectrum has long raised the possibility that ultraviolet effects could significantly alter predictions for cosmological observables. We demonstrate that inflation dynamically suppresses the entire renormalization sector: while super-Hubble perturbations freeze after horizon crossing, renormalization contributions decay rapidly during inflation. As a consequence, the observable primordial spectrum is remarkably insensitive to renormalization ambiguities, providing strong evidence for the robustness under renormalization of standard inflationary predictions at observable scales.

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