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Testing scale-invariant inflation against cosmological data

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Fundamental scale invariance was proposed long ago as a new theoretical principle beyond renormalizability. Besides its highly predictive power, a scale-invariant formulation of gravity could provide a natural explanation for the long-standing hierarchy problem and interesting applications in cosmology.
We present a globally scale-invariant model of gravity and study its cosmological solutions. The system admits a dynamical flow from an unstable to a stable fixed point, during which scale symmetry gets spontaneously broken, and a mass scale —the Planck mass —is classically generated. This trajectory is compatible with an arbitrarily long stage of inflation.
We discuss the main results of the analysis performed in arXiv:2403.04316, where a numerical solution to the two-field dynamics of the system allowed us to corroborate previous analytical findings and set robust constraints on the model's parameters using the latest Cosmic Microwave Background data from Planck and BICEP/Keck.

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