

Inflationary dynamics with a smooth slow-roll to constant-roll era transition

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Abstract

© 2017 IOP Publishing Ltd and Sissa Medialab srl . In this paper we investigate the implications of having a varying second slow-roll index on the canonical scalar field inflationary dynamics. We shall be interested in cases that the second slow-roll can take small values and correspondingly large values, for limiting cases of the function that quantifies the variation of the second slow-roll index. As we demonstrate, this can naturally introduce a smooth transition between slow-roll and constant-roll eras. We discuss the theoretical implications of the mechanism we introduce and we use various illustrative examples in order to better understand the new features that the varying second slow-roll index introduces. In the examples we will present, the second slow-roll index has exponential dependence on the scalar field, and in one of these cases, the slow-roll era corresponds to a type of α -attractor inflation. Finally, we briefly discuss how the combination of slow-roll and constant-roll may lead to non-Gaussianities in the primordial perturbations.

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Keywords

inflation, physics of the early universe

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