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Slow-roll inflation in Palatini $F(R)$ gravity

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We study single field slow-roll inflation in the presence of $F(R)$ gravity in the Palatini formulation. In contrast to metric $F(R)$, when rewritten in terms of an auxiliary field and moved to the Einstein frame, Palatini $F(R)$ does not develop a new dynamical degree of freedom. However, it is not possible to solve analytically the constraint equation of the auxiliary field for a general $F(R)$. We propose a method that allows us to circumvent this issue and compute the inflationary observables. We apply this method to test scenarios of the form $F(R) = R + \alpha R^n$ and find that, as in the previously known $n = 2$ case, a large α suppresses the tensor-to-scalar ratio r.
We also find that models with $F(R)$ increasing faster than R^2 for large R suffer from numerous problems, with possible implications on the theoretically allowed UV behaviour of such Palatini models.

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