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A Conformal Bi-metric Model for the Inflationary Phase

We consider a pure geometric action that characterizes a bi-metric gravity model, where the two metric tensors are conformally related to each other through a conformal factor physically represented by a scalar field.
We show how this scalar field can be seen as the field that drives the Inflationary expansion. The only two parameters of the action are respectively the Planck energy scale and the energy scale of Inflation, while the inflationary potential has the shape of the Landau-Ginzburg potential. For this potential, that is well known in the inflationary scenario, the theoretical prediction of the spectral index is in good agreement with the recent experimental
data.
Moreover the metric of the MTZ (Martinez-Troncoso-Zanelli) Black Holes is a solution of this model and in the cosmological context, we can regard these Black Holes as (unstable) Primordial Black Holes.
As a final remark, we show that in two dimensions our model is related to Liouville gravity.

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