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Non-Gaussianities in multi-field inflation with curved field space when heavy entropic perturbations are integrated out

Multi-field models of inflation with curved field space and non-geodesic motion have recently been under scrutiny as realistic realizations of high-energy physics in the Early Universe.
Focusing on 2-field models, we present the covariant 3rd order action in terms of the adiabatic comoving curvature perturbation and the entropic field perturbation. We extend Maldacena's calculation to such models with generic field space, by showing how we can estimate the right size of each interaction after multiple integrations by parts in the action and careful study of the boundary terms.
Furthermore, when entropic fluctuations are heavy we integrate them out at the level of the 2nd and 3rd order actions, leading to an effective single-field theory for the observable adiabatic perturbation only. The sizes of the interactions in this EFT, that explicitly depend on the geometry of the underlying field space, are computed analytically. These results open a new window to investigate the geometry of inflationary models via the observation of primordial non-Gaussianities.

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