Non-gaussianities in multi-field inflation with strongly non-geodesic motion

Recent proposals to embed inflation in high-energy physics rely on trajectories with large bending in negatively curved field space. Although the linear perturbations of these models have already been studied, we present here one of the first analysis of the non-gaussianities for such multi-field models with strongly non-geodesic motion. We also interpret the already noticed exponential enhancement of the short wavelength modes as a transient tachyonic instability. Assuming a perturbative picture holds, and supported by first-principle numerical computations, we show that an effective single-field theory enables to capture the fluctuations of the full two-field model. We show analytically and numerically that this class of models exhibits a large bispectrum peaking in the flattened configuration, and understand the structure of all higher-order correlation functions. Thus, we derive a bound on the enhancement of the tree-level power spectrum for perturbativity to hold, heavily constraining inflationary models with strongly non-geodesic motion. In particular, these results exclude the recent model of hyperinflation in its more interesting incarnation that verifies the much discussed De Sitter swampland conjecture.