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Analytical methods in stochastic inflation

The stochastic formalism of cosmic inflation enables us to describe the large-scale dynamics non-perturbatively. Even in the slow-roll regime, however, it is in general difficult to solve the fundamental equations analytically due to the stochastic nature of fluctuations. I will present the two analytical methods in stochastic inflation. One is a class of all the possible exact solutions for a test field, which can for instance be applied to a curvaton scenario to study the structure of the parameter space. The other is the constrained formalism of stochastic inflation, which gives an easy and efficient way to analyse statistically rare realisations that would divert the field-space trajectories towards single-field attractors.

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