Contribution ID: **44** Type: **not specified**

Constraining inflationary flow equations with the spectral index relation n - 1 = -2/N

Wednesday 19 November 2025 09:55 (15 minutes)

Constraining inflationary flow equations with $n_s - 1 = -2/N$

Vineshree Pillay
University of Cape Town | vineshree.pillay013@gmail.com
Supervisor: Prof. Peter Dunsby

Abstract

This work presents an approach to inflationary cosmology that incorporates the spectral index relation $n_s - 1 = -2/N$ directly into the Hubble slow-roll hierarchy. Traditional methods treat slow-roll parameters as independent, potentially leading to trajectories inconsistent with CMB observations.

We use the spectral index as a constraint to determine the third slow-roll parameter λ_3 throughout the evolution, ensuring trajectories remain observationally consistent. The constrained system is implemented numerically and compared with standard approaches.

This method aims to provide a more reliable connection between theoretical inflation models and observational constraints while maintaining the full dynamical structure of flow equations.

Keywords: inflationary cosmology, slow-roll approximation, spectral index, numerical methods

Author: PILLAY, Vineshree (University of Cape Town)

Presenter: PILLAY, Vineshree (University of Cape Town)