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Quantum corrections in curved space-times and the inflationary power spectrum

Abstract

In a quantum field theory on a curved time-dependent background, time-translational symmetry is broken and we therefore expect time-dependent loop corrections after renormalization for any interacting quantum field. We investigate renormalization and the finite radiative corrections in the simplest inflationary models in the Close-Time-Path formalism, which allows to describe the evolution of a state from an initial time. We disentangle the time-dependence caused by the background and by the initial state and discuss consequences for the power spectrum of primordial fluctuations.