

Holographic β function in de Sitter space

Friday, 26 November 2021 16:45 (15 minutes)

We investigate infrared logarithms in inflationary Universe from holographic perspective. We derive gravitational Fokker-Planck and Langevin equations to investigate the time evolution of the de Sitter entropy $S = \pi/G_N H^2(t)$. $H(t)$ is the time dependent effective Hubble parameter and G_N is the Newton's constant. Our approach focuses on the conformal modes to respect local Lorentz symmetry. In term of the curvature perturbations, it is shown to be consistent with δN formalism. Under the Gaussian approximation, we obtain the dynamical β function of $g = 1/S$. The dimensionless gravitational coupling g is asymptotically free toward the future. It also possesses the ultraviolet fixed point indicating that the Universe begun with the de Sitter expansion at the Planck scale with $\epsilon = 0$. We further interpret inflationary Universes as the UV complete composite states. Since our analysis is trustable for small g , our conclusion is that inflationary universe is consistent in the semiclassical regime.

Presenter: KITAZAWA, Yoshihisa (KEK)

Session Classification: Short talks