Title:	Stress energy correlator in de Sitter spacetime: Its conformal masking or growth in connected Friedmann universes
Authors:	Dhanuka, A. (/jspui/browse?type=author&value=Dhanuka%2C+A.) Lochan, K. (/jspui/browse?type=author&value=Lochan%2C+K.)
Keywords:	Stress energy Sitter spacetime Friedmann universes
Issue Date:	2020
Publisher:	American Physical Society.
Citation:	Physical Review D, 102(8)
Abstract:	Semiclassical physics in the gravitational scenario, in its first approximation (first order), cares only for the expectation value of the stress energy tensor and ignores the inherent quantum fluctuations thereof. In the approach of stochastic gravity, on the other hand, these matter fluctuations are supposed to work as the source of geometry fluctuations and have the potential to render the results from first-order semiclassical physics irrelevant. We study the object of central significance in stochastic gravity, i.e., the noise kernel, for a wide class of Friedmann spacetimes. Through an equivalence of quantum fields on de Sitter spacetime and those on generic Friedmann universes, we obtain the noise kernel through the correlators of stress energy tensor for fixed comoving but large physical distances. We show that in many Friedmann universes including the expanding universes, the initial quantum fluctuations the universe is born with may remain invariant and important even at late times. Furthermore, we explore the cosmological spacetimes where even after long times the quantum fluctuations remain strong and become dominant over large physical distances, which the matter-driven universe is an example of. The study is carried out in minimal as well as nonminimal interaction settings. Implications of such quantum fluctuations are discussed.
URI:	https://journals.aps.org/prd/abstract/10.1103/PhysRevD.102.085009 (https://journals.aps.org/prd/abstract/10.1103/PhysRevD.102.085009) http://hdl.handle.net/123456789/3270 (http://hdl.handle.net/123456789/3270)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)