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Title:	Correspondences of matter fluctuations in semiclassical and classical gravity for cosmological spacetime
Authors:	Satin, S. (/jspui/browse?type=author&value=Satin%2C+S.)
Keywords:	Minimally coupled scalar fields Astrophysical Spacetime statistical
Issue Date:	2019
Publisher:	American Physical Society
Citation:	Physical Review D, 100(4).
Abstract:	<p>A correspondence between fluctuations of minimally coupled scalar fields and that of an effective perfect fluid is shown to exist. A similar correspondence between the stress tensors themselves is known and widely used in literature. Using recent results obtained in semiclassical stochastic gravity for the fluctuations of the quantum stress tensor, we obtain this correspondence, which is argued to be of fundamental importance to statistical analysis of systems in curved spacetime. We show that the scalar field fluctuations are related to covariances of energy density and pressures of the effective perfect fluid. Such a correspondence between the semiclassical and classical fluctuations therefore, is expected to give insight to the mesoscopic phenomena for gravitating systems and would further enhance the perturbative analysis for cosmological spacetimes and astrophysical objects in the decoherence limit. A kinetic theory in curved spacetime may find useful insights from such correspondences in future work.</p>
URI:	https://journals.aps.org/prd/abstract/10.1103/PhysRevD.100.044032 (https://journals.aps.org/prd/abstract/10.1103/PhysRevD.100.044032) http://hdl.handle.net/123456789/1907 (http://hdl.handle.net/123456789/1907)
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