

Abstract Submitted
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Canonical cosmological perturbation theory with geometrical clocks and Dirac observables¹ PARAMPREET SINGH, Louisiana State University, Baton Rouge, KRISTINA GIESEL, Friedrich-Alexander-Universitt Erlangen-Nrnberg — Working with an extended phase space, where lapse and shift are not treated as Lagrange multipliers, we explore connections between geometrical clocks, Dirac observables and gauge-invariant quantities in linearized canonical cosmological perturbation theory. Our approach allows understanding various gauge-invariant variables such as Bardeen potential in canonical setting which was not possible in the existing approach to canonical perturbation theory. In this sense, our analysis bridges gap between canonical perturbation theory and the conventional approach. An efficient method is introduced to derive evolution equations for gauge-invariant quantities which is illustrated for Bardeen potential and Mukhanov-Sasaki variable.

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