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The role of the counterterms in the conservation of superhorizon curvature perturbations at one loop

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Recently, several papers have claimed that superhorizon curvature perturbations are not conserved at the one-loop level in single-field inflation models if there is a transient ultra-slow-roll period. In this talk, I point out that the contributions from the counterterms were overlooked in the recent papers. I show that the counterterm contributions play a crucial role in canceling the one-loop power spectrum of superhorizon curvature perturbations in the comoving gauge. This talk will be based on arXiv:2502.12112.

Author: INOMATA, Keisuke (Johns Hopkins University)

Presenter: INOMATA, Keisuke (Johns Hopkins University)

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