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Curvature Perturbations Protected Against One Loop

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I examine one-loop corrections from small-scale curvature perturbations to the superhorizon-limit ones in single-field inflation models, which have recently caused controversy. I consider the case where the Universe experiences transitions of slow-roll (SR) ⟶ intermediate period ⟶ SR. The intermediate period can be an ultra-slow-roll period or a resonant amplification period, either of which enhances small-scale curvature perturbations. I assume that the superhorizon curvature perturbations are conserved at least during each of the SR periods. Within this framework, I show that the superhorizon curvature perturbations during the first and the second SR periods coincide at one-loop level in the slow-roll limit.

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