

One-loop infrared rescattering by enhanced scalar fluctuations during inflation

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I will describe that, whenever the perturbations of some field are excited during inflation by a physical process on sub-horizon scales, they unavoidably generate, even through gravitational interactions alone, a significant resonant infrared cascade of power down to scales that are of the order of the horizon at that time. I will give general analytic one-loop results for the enhancement of the infrared power of the curvature perturbation generated by this effect, highlighting the role played by the resonance. I will also show lattice simulations result for this phenomenon, which can impact the phenomenology associated with a variety of mechanisms considered in the literature, notably concerning primordial black holes and gravitational waves.

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