

Non-Singular Bouncing Cosmology and Cosmological Perturbations

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We explicitly confirm that spatially flat non-singular bouncing cosmologies make sense as effective theories. The presence of a non-singular bounce in a spatially flat universe implies a temporary violation of the null energy condition, which can be achieved through a phase of ghost condensation. We calculate the scale of strong coupling and demonstrate that the ghost-condensate bounce remains trustworthy throughout, and that all perturbation modes within the regime of validity of the effective description remain under control.