

# The Matter Bounce Scenario in Loop Quantum Cosmology

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The matter bounce scenario is an alternative to inflation where scale-invariant perturbations are generated in a dust-dominated contracting space-time. In the context of loop quantum cosmology, the cosmological singularity is generically resolved and replaced by a bounce; furthermore, it is possible to deterministically evolve the perturbations from the contracting branch through the quantum bounce and calculate the form of the perturbations at the onset of the expanding branch. For the matter bounce scenario in loop quantum cosmology, scale-invariant perturbations and a small tensor-to-scalar ratio are predicted [1], in agreement with the latest observations of Planck and BICEP2 [2].

#### *References*

- [1] E. Wilson-Ewing, *The Matter Bounce Scenario in Loop Quantum Cosmology*, JCAP 1303 (2013) 026, arXiv:1211.6269 [gr-qc].
- [2] Y.-F. Cai, J. Quintin, E. N. Saridakis and E. Wilson-Ewing, *Nonsingular bouncing cosmologies in light of BICEP2*, arXiv:1404.4364 [astro-ph.CO].

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