

Quantum and classical properties of interacting primordial inhomogeneities

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The statistical properties of the Cosmic Microwave Background (CMB) anisotropies, which reflect the curvature inhomogeneities of the early Universe, are well-accounted for by assuming that these inhomogeneities emerged from amplified vacuum fluctuations. As they result from a genuine quantum process, it is natural to question which properties of these primordial inhomogeneities are inherently quantum and which, if any, have persisted until their observation despite interactions that induced decoherence, thereby rendering them classical. I will review the latest progress on these questions. References: Martin, J., Micheli, A., & Vennin, V. (2022). Discord and decoherence. *Journal of Cosmology and Astroparticle Physics*, 2022(04), 051. Micheli, A., & Peter, P. (2023). Quantum Cosmological Gravitational Waves? In C. Bambi, L. Modesto, & I. Shapiro (Eds), *Handbook of Quantum Gravity* (pp. 1-66) Micheli, A., Oshima, Y., & Takahashi, T. (2025) Squeezing of cosmological perturbations in presence of decoherence, in preparation

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