

Coherent fields in cosmology

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Summary

Coherently oscillating scalar fields play a fundamental role in models of inflation or in axion dark matter scenarios. In this talk we present recent results on the dynamics of coherent fields of higher spin in cosmological space-times. We show that, regardless of the spin, the energy-momentum tensor of homogeneous fields is always isotropic in average provided the fields remain bounded and evolve rapidly compared to the rate of expansion. An analytic expression for the average equation of state is obtained for Lagrangians with generic power-law kinetic and potential terms. As an example we discuss the behavior of a spin-two field in the standard Fierz-Pauli theory of massive gravity. We also consider the evolution of density perturbations of massive coherent fields and discuss their possible behaviour as dark matter candidates.

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