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Dark Energy Instabilities induced by Gravitational Waves

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In this talk I will discuss the classical decay of gravitational waves into dark energy fluctuations π in the context of the EFT of Dark Energy. For cubic Horndeski and beyond Horndeski theories, the gravitational wave acts as a classical background for π and thus modifies its dynamics. In particular, for a sufficiently large amplitude of the wave, the kinetic term of π becomes pathological, featuring gradient and ghost instabilities. For smaller gravitational wave amplitude, π fluctuations are described by a Mathieu equation and feature instability bands that grow exponentially. The gravitational wave signal is affected by the π back-reaction and this provides very stringent bounds on cubic and quartic GLPV theories.

Author: TAMBALO, Giovanni (SISSA)

Co-authors: Prof. VERNIZZI, Filippo (IPhT-CEA, Saclay); CREMINELLI, Paolo (Scuola Normale Superiore (SNS)); YINGCHAROENRAT, Vicharit

Presenter: TAMBALO, Giovanni (SISSA)

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