

Abstract Submitted
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Testing modified gravity theories using Tensor Perturbation¹

WEIKANG LIN, Univ of Texas - Dallas, MUSTAPHA ISHAK, University of Texas at Dallas — Primordial gravitational waves are promising to deliver a new and powerful window to probe the physics of the early universe and gravity. In modified gravity theories, tensor perturbation can propagate with an additional friction or a non-standard dispersion relation. Keeping the friction a constant, we parameterize the dispersion relation in three ways. While the constant dispersion parametrization corresponds to a constant speed and the low k/a parametrization coincides with a massive gravity model, the high k/a parametrization has not been studied in the literature. Current available data give excluded regions in the r and modified gravity parameter spaces. With a performance forecast and $r_{fid} = 0.005$, we found that if no deviation from G CORE will limit significantly the allowed modified gravity parameter spaces. Specially, the minimum detectible graviton mass for CORE is about $7 \times 10^{-33} eV$, which is of the same order of magnitude as the graviton mass should massive gravity be responsible for the late time acceleration of the universe. We also study the tensor perturbation during inflation with our parameterization.

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