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How-to: testing alternatives theories of gravity with gravitational waves

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General relativity predicts Gravitational waves (GWs) to propagate through the Friedmann–Lemaître–Robertson–Walker (FLRW) metric as a spherical wave at the speed of light and with a friction term given by the expansion of the universe. However, several modified gravity theories (such as massive gravity or effective field theories in the dark energy sector), modify the friction term and the speed of a propagating GW in the FLRW metric, adding in some cases also a frequency dependent dispersion relation. In this talk we will present how to measure these modifications with observations of GWs from compact binary coalescences. Moreover we will review the current constrains by the LIGO and Virgo observations of gravitational waves.

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