

Cosmic Self-Acceleration from Modified Gravity before/after GW170817

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Scalar-tensor modifications of gravity have long been considered as an alternative explanation for the late-time accelerated expansion of our Universe. I will first show that a rigorous discrimination between acceleration from modified gravity and from a cosmological constant or dark energy was not possible with observations of the large-scale structure alone. I will then demonstrate how the measurement of the cosmological speed of gravitational waves with GW170817 breaks this dark degeneracy and how the combination of the two challenges the concept of cosmic acceleration from one of the most general scalar-tensor modifications of gravity. Even more general theories, however, reintroduce the dark degeneracy and I will show how a more conclusive result will only be possible with a large number of Standard Sirens. (Refs: 1509.08458; 1602.07670; <https://arstechnica.com/science/2017/02/theoretical-battle-dark-energy-vs-modified-gravity>).

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