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Cosmology with LIGO/Virgo dark sirens and galaxy catalogs

Thursday, September 9, 2021 11:00 AM (30 minutes)

We will briefly present a detailed study of the methodology for correlating “dark sirens” (compact binaries coalescences without electromagnetic counterpart) with galaxy catalogs. Several improvements on the current state of the art will be examined and applied to the published LIGO/Virgo gravitational wave (GW) detections, studying several sources of systematic errors. We will give the best result measurement of H_0 from dark sirens alone, as well as combining with the counterpart of GW170817. We will also discuss the application of this formalism to the study of modified GW propagation (which is a smoking gun of dark energy and modifications of gravity at cosmological scales). Current observations of dark sirens already start to provide interesting limits, and we will show the results using them alone for the measurement of the parameter Ξ_0 , which measures deviations from GR. If time permits, we will also briefly present other ways of obtaining information on this parameter.

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