

Phenomenology: Testing GR with large catalogs: the cosmic variance of hierarchical stacking

Thursday, September 7, 2023 3:00 PM (15 minutes)

Testing the strong gravity regime of general relativity is a primary goal of gravitational wave detectors. While it is expected that corrections to GR are small and unlikely to be identified with individual events, third generation GW detectors will allow to detect tens-of-thousands of events per year. Therefore, they will pave the way to precision tests by carefully stacking all the detected events. In this talk, I address a challenge to hierarchical tests of GR, arising from the fact that we only detect a single, finite-size realization of the population of events. This can induce biases in the outcome of the test, even when a large catalog has been stacked. I will discuss how to statistically account for this effect and avoid false claims of deviations from GR. Finally, I will comment on the prospects of shifting from a Bayesian paradigm to a frequentist approach when testing GR with gravitational waves.

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