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Ringdown tests of the black-hole paradigm

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Gravitational waves offer the promising prospect of testing one of the main predictions of general relativity, namely the presence of black holes beyond which nothing can escape.

The ringdown is the final stage of a compact binary coalescence when the remnant settles down to a stationary configuration. It is modelled as a superposition of exponentially damped sinusoids whose frequencies and damping times are related to the remnant's oscillation frequencies, the so-called quasinormal modes.

In this talk, I will describe how parametrised tests of general relativity can test the black-hole paradigm by constraining deviations in the frequency and damping time of the quasinormal modes.

I will also describe how false violations of general relativity can arise in the data due to missing physics in the waveform models or poorly understood noise artefacts.

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