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Polarization modes of gravitational waves in quadratic gravity
PRATIK WAGLE, University of Illinois at Urbana Champaign, Illinois, ALEXANDER SAFFER, University of Virginia, Charlottesville, Virginia, NICOLAS YUNES, University of Illinois at Urbana Champaign, Illinois — The observation of the inspiral and merger of compact binaries by the LIGO-Virgo collaboration has allowed for new tests of Einstein’s theory in the extreme gravity regime, where gravitational interactions are simultaneously strong, non-linear, and dynamical. Theories beyond Einstein’s can also be constrained by detecting the polarization modes of gravitational waves. In this talk, I will show that dynamical Chern-Simons gravity and Einstein-dilaton-Gauss-Bonnet gravity cannot be differentiated from general relativity based on the detection of polarization modes alone. To prove this result, I will be using the Newman-Penrose method and an irreducible decomposition method to find that only the tensorial (plus- and cross-polarization) modes can be detected in both these theories.

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