Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Exploring the impact of higher-order modes on inferring source properties from gravitational-wave observations JENNIFER SANCHEZ, California State University, Fullerton, ALAN J. WEINSTEIN, COLM TALBOT, California Institute of Technology — Advanced LIGO and Advanced Virgo have confidently detected a number of gravitational wave signals, including waves from dozens of binary black hole mergers and two mergers of binary neutron stars. Each observation contains encoded information about the physical properties of the binary system. As gravitational-wave detectors continue to improve their sensitivity and thus their astronomical reach, the improvements will allow us to detect rarer systems and make more confident statements regarding their source properties. In order to fully characterize the gravitational wave observations, we rely on numerical and analytical models that approximate the signal waveforms from the emitted source as specified by the source parameters (e.g. masses, spins, sky location, etc). The dominant emission frequency of gravitational waves from compact binary coalescence is at twice the orbital frequency; however, recently published events (e.g. GW190412) have demonstrated evidence of subdominant, higher-order harmonic contributions. In this talk, I will discuss a study exploring the impact of including (using newly improved signal models) or neglecting these higher-order modes in gravitational wave signals on the signals' sources' inferred physical properties.

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Date submitted: 11 Jan 2021 Electronic form version 1.4