Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Multipolar effective-one-body waveforms for eccentric, spin-aligned binary black holes MOHAMMED KHALIL, ALESSANDRA BUONANNO, Max Planck Institute for Gravitational Physics - University of Maryland, College Park, SERGUEI OSSOKINE, ANTONI RAMOS-BUADES, JAN STEINHOFF, JUSTIN VINES, Max Planck Institute for Gravitational Physics — While most binary mergers are expected to circularize when they enter the LIGO/Virgo frequency band, a small fraction of those binaries could have non-negligible orbital eccentricity depending on their formation channel. Hence, it is important to accurately model eccentricity effects in waveform models to detect those binaries, infer their properties and shed light on their astrophysical environment. In this talk, I will present a multipolar effective-one-body (EOB) eccentric waveform model for spin-aligned black holes. In the quasi-circular orbit limit, it reproduces the state-of-the-art EOB model currently used in LIGO/Virgo analyses (SEOBNRv4HM). The waveform model contains eccentricity effects in the radiation-reaction force and gravitational modes through second post-Newtonian order, including tail effects, spin-orbit, and spin-spin couplings. I will also present results that validate such an eccentric waveform model against numerical-relativity simulations.

Mohammed Khalil
University of Maryland, College Park

Date submitted: 08 Jan 2021 Electronic form version 1.4