

Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Detectibility of black hole modes from misaligned coalescences¹

HALSTON LIM, SCOTT HUGHES, Massachusetts Institute of Technology MIT, GAURAV KHANNA, UMass Dartmouth/University of Rhode Island — In recent work, we examined how different modes in the ringdown phase of a binary coalescence are excited as a function of the final plunge geometry. At least in the large mass-ratio limit, there is a clean mapping between angles describing the plunge and the amplitude of different quasi-normal modes which constitute the ringdown. In binaries where the black hole's spin and the orbital plane are misaligned, multiple harmonic modes can be significantly excited and imprinted on the observable waveform. In this talk, we discuss the prospect for inferring the plunge geometry from a spectrum of measured fundamental harmonic modes in various detection scenarios.

¹Our work on this problem was supported at MIT by NSF Grants PHY-1403261 and PHY-1707549

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Date submitted: 08 Jan 2021

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