Abstract Submitted
for the APR20 Meeting of
The American Physical Society

A Spheroidal Harmonic Picture for GWs from Astrophysical Sources II: Binary Black Holes LIONEL LONDON, SCOTT HUGHES, Massachusetts Institute of Technology MIT — Gravitational wave signal modeling is significantly influenced by the spin weighted spherical harmonic multipole formalism; however, spin weighted spherical harmonics are only the angular modes for systems with zero angular momentum. In this talk we build upon recent results in black hole perturbation theory which illustrate that, when space-time angular momentum is accounted for, the resulting spheroidal harmonics display bi-orthogonality, and thereby allow for a novel spectral decomposition of gravitational radiation into spheroidal harmonic multipole moments. We discuss prospects for this new multipolar perspective in the context of signal modeling for extreme and comparable mass-ratio binary black hole coalescences.

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Date submitted: 14 Jan 2020 Electronic form version 1.4