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Numerical Relativity Ringdown Waveforms: From Spherical to Spheroidal Mode Decomposition LIONEL LONDON, JAMES HEALY, DEIRDRE SHOEMAKER, The Georgia Institute of Technology — Numerical Relativity waveforms are traditionally decomposed into spin -2 spherical multipoles. On the other hand, the quasi-normal mode ringdown of black holes is more naturally described by spin -2 spheroidal multipoles. As a consequence, numerical relativity ringdown waveforms consist of a superposition of spheroidal multipoles. We present a robust method that identifies the spheroidal multipole content in numerical relativity waveforms. We demonstrate the efficacy of the method in identifying interesting quasi-normal mode structures in simulations of unequal-mass binary black hole mergers.

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