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Estimating the frequency-domain computation time of extreme mass-ratio inspiral gravitational waveforms¹ DAVID J. LAZAR, LIOR M. BURKO, University of Alabama in Huntsville — We estimate the overall computation time for the frequency-domain calculation of gravitational-wave energy fluxes to infinity for extreme-mass-ratio inspiral binaries consisting of a compact object in orbit around a supermassive black hole on the latter's equatorial plane - an interesting source for LISA. We determine the number of k modes necessary to achieve a desired accuracy for orbits of varying eccentricity. We then model the time required to calculate single k modes and use this model to find the time it takes to sum over all the k modes for a given accuracy level. Work to obtain models that also incorporate summing over multiple m and ℓ modes is currently in progress. Our main goal is to eventually use our data to determine for what part of the parameter space the time-domain approach becomes more computationally efficient than the frequency-domain method.

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