Abstract Submitted
for the APR09 Meeting of
The American Physical Society

Exploring Use of NR Waveforms in Burst Analyses of BBH Mergers[1] DEIRDRE SHOEMAKER, Georgia Tech, LAURA CADONATI, UMass Amherst, SHOUROV CHATTERJI, Caltech, SEBASTIAN FISCHETTI, SATYANARAYAN MOHAPATRA, UMass Amherst — Gravitational wave ground-based detectors and numerical-source codes are individually performing at a top-notch level. We explore the added benefit to the detection and understanding of gravitational wave sources made possible by joining the expertise of numerical relativists and data analysts in addressing the question of what is the most effective role for numerical relativity (NR) waveforms in the detection and characterization of binary black hole (BBH) coalescence. We present a study of detection systematics using waveforms produced by the MayaKranc code that are added to simulated, colored, Gaussian noise and analyzed with the unmodeled burst search algorithm Omega (also used in LIGO-Virgo burst searches). Detection efficiency and parameter accuracy are systematically weighted against parameters such as spin and mass ratio as well as numerical details such as waveform accuracy, the number of included modes and extraction radius. These detection systematics are mapped to numerical and physical choices in NR to determine the effectiveness of numerical waveforms in burst analysis.

[1]Authors acknowledge NSF grants PHY-0653550 and PHY-0653443.

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Date submitted: 09 Jan 2009 Electronic form version 1.4