Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Impact of the tidal p-g instability on the gravitational wave signal from coalescing binary neutron stars REED ESSICK, SALVATORE VITALE, NEVIN WEINBERG, Massachusetts Inst of Tech-MIT — Recent studies suggest that coalescing neutron stars are subject to a fluid instability involving the nonlinear coupling of the tide to p-modes and g-modes. The instability's influence on the inspiral dynamics and thus the gravitational wave signal is, however, uncertain because we do not know precisely how the it saturates. I discuss recent work in which we construct a simple, physically motivated model of the saturation and explore the instability's impact as a function of the model parameters. We find that for plausible assumptions about the saturation, current gravitational wave detectors might miss more than 70% of events if only point particle waveforms are used. Parameters such as the chirp mass, component masses, and luminosity distance might also be significantly biased. On the other hand, we find that relatively simple modifications to the point particle waveform can alleviate these problems and enhance the science that emerges from the detection of binary neutron stars.

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Date submitted: 01 Oct 2016 Electronic form version 1.4