Abstract Submitted
for the APR10 Meeting of
The American Physical Society

Fundamental bias and the Parameterized Post-Einstenian Framework[1] NICOLAS YUNES, FRANS PRETORIUS, Princeton University — With the imminent detection of gravitational waves, we must ask ourselves: how much do we trust general relativity? Experimental tests have confirmed the validity of general relativity in the weak-field, but no such tests exist in the strong, dynamical regime. Because of their inherent weakness, the extraction of gravitational waves relies on matched filtering, where templates are used to filter data. Currently, such templates are constructed assuming general relativity is correct and this assumption constitutes a fundamental bias, which could introduce a systematic error in the detection and parameter estimation of signals. In this talk, I define this bias, explain its possible consequences and propose a remedy: the parameterized post-Einsteinian framework. This framework enhances waveforms via the inclusion of post-Einsteinian parameters that allow for well-motivated deviations from general relativity. Matched filtering with these waveforms allows the data to select the theory that describes gravitational wave emission and propagation, without *a priori* assuming the validity of general relativity.

[1]We acknowledge support from NSF grant PHY-0745779.

Nicolas Yunes
Princeton University

Date submitted: 19 Oct 2009 Electronic form version 1.4