Abstract Submitted
for the CAL10 Meeting of
The American Physical Society

Spin precession and the detestability of gravitational waves from inspiraling compact binaries AJITH PARAMESWARAN, California Institute of Technology — Inspiraling compact binaries are among the most promising candidate sources for the first detection of gravitational waves. If at least one of the compact objects is rapidly spinning, the general-relativistic spin-orbit and spin-spin coupling cause the binary's orbital plane to precess, producing a visible signature in the emitted gravitational waveforms. These signals are searched over in the data of gravitational-wave detectors using the technique of matched filtering, which involves cross correlating the data with a bank of theoretical templates. A full description of the waveforms requires the use of at least 8 parameters describing the masses and spins of the objects. But performing a search using this 8-parameter template family has a number of difficulties, including the increased false-alarm rate and prohibitive computational cost. In this talk, I propose a post-Newtonian template family described by the two mass parameters and a *single* spin parameter (describing the dominant spin-orbit coupling effect), and demonstrate that the template family is "effectual" enough in detecting precessing binaries in the comparable-mass regime.

Ajith Parameswaran
California Institute of Technology

Date submitted: 01 Oct 2010 Electronic form version 1.4