

Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Inspiralling compact binaries in scalar-tensor theories of gravity: Equations of motion to 2.5 post-Newtonian order SAEED MIRSHEKARI, CLIFFORD WILL, Washington University in St. Louis — We derive the scalar-tensor equations of motion for non-spinning compact objects, including black holes and neutron stars, to order $(v/c)^5$ beyond Newtonian order. We use the DIRE (Direct Integration of the Relaxed Einstein Equations) formalism [1] adapted to scalar-tensor theory, coupled with Eardley's scheme [2] for incorporating compact, quasi-stationary, self-gravitating bodies. We find that to this order of the PN approximation, binary black hole behavior in this class of theories is indistinguishable from that predicted by general relativity. Supported in part by the NSF, PHY 09-65133.

[1] A. G. Wiseman and C. M. Will, Phys. Rev. D 54, 4813 (1996); M. E. Pati and C. M. Will, Phys. Rev. D 62, 124015 (2000); *ibid.* 65, 104008 (2002).

[2] D. M. Eardley, Astrophys. J. Lett. 196, L59 (1975).

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Date submitted: 04 Jan 2012

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