Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Dynamical scalarization of neutron stars in scalar-tensor gravity theories CARLOS PALENZUELA, Canadian Institute for Theoretical Astrophysics, ENRICO BARAUSSE, Institut d'Astrophysique de Paris, MARCELO PONCE, University of Guelph, LUIS LEHNER, Perimeter Institute — We present a framework to study generic neutron-star binaries in scalar-tensor theories of gravity. Our formalism achieves this goal by suitably interfacing a post-Newtonian orbital evolution with a set of non-linear algebraic equations to describe the scalar charge of each binary's component along the evolution in terms of isolated-star data. We validate this semi-analytical procedure by comparing its results to those of fully general-relativistic simulations, and use it to investigate the behavior of binary systems in large portions of the parameter space of scalar-tensor theories. This allows us to shed further light on the phenomena of "dynamical scalarization," which takes place in tight binaries even for stars that have exactly zero scalar charge in isolation. Finally, we discuss the extent to which deviations from General Relativity can be detected, either directly by the emitted gravitational waves, or by their electromagnetic counterparts.

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Date submitted: 10 Jan 2014 Electronic form version 1.4