

# Dynamics of compact binary systems in scalar-tensor theories at the third post-Newtonian order

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May 9, 2017

## ABSTRACT

In the upcoming years, the observation of gravitational waves from inspiraling compact binary systems will allow us to test General Relativity in its strong field regime. Both the detection and precise determination of the physical parameters of gravitational waves require a bank of very accurate template gravitational waveforms. In order to constrain the deviations from General Relativity, one also has to build template waveforms in alternative theories of gravity. In this talk, I will focus on massless scalar-tensor theories and address the question of the dynamics of non-spinning compact binary systems at 3PN order in harmonic coordinates. This is needed in order to compute the scalar and gravitational waveforms at 2PN order. In particular, I will present our method which is based on a Fokker action adapted to the specificities of both the post-Newtonian formalism and ST theories. I will then derive the conserved energy and momentum at 3PN order.