

Radiation-reaction effects at 3PN order in scalar-tensor theories

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With the advent of third-generation gravitational-wave detectors, it has become crucial to extend analytical frameworks used to model waveforms from compact binary systems to alternative theories of gravity. In this talk, I will present recent results on radiation-reaction effects in a class of scalar–tensor theories. Using the post-Newtonian multipolar post-Minkowskian (PN–MPM) formalism, we compute the dissipative contributions to the ten Noetherian conserved quantities, which can be classified into two types: Schott and pseudo-Schott terms. In contrast to general relativity, where only pseudo-Schott terms contribute to the waveform phasing at 4.5PN order for quasi-circular orbits, we find that Schott terms begin to contribute already at 3PN order, even in the quasi-circular case. These contributions must therefore be consistently included in the future when extending the energy flux and waveform, currently known up to 2.5PN order, to 3PN order.

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