

E. Dones: Tidal effects on gravitational waveforms in massless scalar-tensor theories of gravity (WP1)

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The arrival of third-generation gravitational wave detectors in 2030-2035, such as the Einstein Telescope and the space-based LISA detector, promises major advances in our understanding of the theory of gravity and of compact objects. However, the very high precision of the expected data presents us with new challenges, including distinguishing, when analyzing gravitational wave data, between effects due to a change in the theory of gravity and those coming from the matter of neutron stars. Therefore, it is necessary to develop very accurate waveforms for the analysis that consider both effects at the same time. In this talk, I will introduce how the post-Newtonian framework, initially developed to describe the inspiral phase of a compact binary coalescence in GR, has been adapted for massless scalar-tensor theories of gravity. I will show how to incorporate tidal effects in our models and also discuss how likely we will be observing these effects in the future.