

Relativistic equations of motion of massive bodies

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Abstract. Highly relativistic equations of motions will play a crucial role for the detection and analysis of gravitational waves emitted by inspiralling compact binaries in detectors LIGO/VIRGO on ground and LISA in space. Indeed these very relativistic systems (with orbital velocities of the order of half the speed of light in the last orbital rotations) require the application of a high-order post-Newtonian formalism in general relativity for accurate description of their motion and gravitational radiation [1]. In this contribution the current state of the art which has reached the third post-Newtonian approximation for the equations of motion [2–6] and gravitational waveform [7–9] has been described (see [10] for an exhaustive review). We have also emphasized the successful matching of the post-Newtonian templates to numerically generated predictions for the merger and ring-down in the case of black-hole binaries [11].

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