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Radiation reaction at fourth-and-a-half post-Newtonian order

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Gravitational radiation reaction for compact binary systems has historically been studied using post-Newtonian theory, which is well adapted for the inspiraling phase and has the advantage of yielding fully analytical results. I will present recent work where we obtain the equations of motion for the two-body problem at 4.5PN order, in a generic frame. We prove for the first time the validity of the four balance equations (energy, angular momentum, linear momentum and center-of-mass position) at 2PN order, and find a novel nonlocal term when expressing the acceleration in the center-of-mass frame.

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