

Gravitational-wave mode (2,1) for a binary system of compact objects at the third post-Newtonian approximation

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The post-Newtonian approximation is an essential ingredient in constructing waveform templates for binary systems of compact objects to be used in data analysis of gravitational-wave signals. The phases of such signals, in particular, must be determined analytically with great accuracy in order to reduce the biases that may arise in parameter estimation or when combining analytic results with numerical relativity. The computation of the source quadrupole moment of two point-like bodies at the third post-Newtonian (3PN) order is an important step towards getting the targeted 4PN gravitational-wave phase. This talk sketches the way it has been achieved by means of dimensional regularisation combined with renormalisation. It is in fact a Hodge-type dual of the current moment with the symmetry of some specific Young tableau that has been generalised to d dimensions for this purpose. The final result is used to construct the 3PN gravitational-wave mode (2,1).

Authors: M. HENRY, Quentin (I.A.P.); M. FAYE, Guillaume (I.A.P.); M. BLANCHET, Luc (I.A.P.)

Orateur: M. FAYE, Guillaume (I.A.P.)

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