

## Gravitational-wave tails of tails

This article has been downloaded from IOPscience. Please scroll down to see the full text article.

2005 Class. Quantum Grav. 22 3381

(<http://iopscience.iop.org/0264-9381/22/16/C01>)

View [the table of contents for this issue](#), or go to the [journal homepage](#) for more

Download details:

IP Address: 194.167.0.52

The article was downloaded on 22/06/2011 at 19:03

Please note that [terms and conditions apply](#).

## Corrigendum

### Gravitational-wave tails of tails

L Blanchet 1998 *Class. Quantum Grav.* **15** 113–141

The contribution of tails in the flux of gravitational waves  $\mathcal{L}$  from compact binaries at 3.5PN order has been incorrectly computed. The tails at this order arise from interaction between the mass monopole moment  $M$  of the source and higher-order multipole moments. When replacing these moments into equation (4.19) in the case of compact binary systems it was incorrectly assumed that the mass  $M$  is just given by the sum of the rest masses,  $m = m_1 + m_2$ . However  $M$  is in fact given by the ADM mass of the binary and should involve relativistic corrections. The same error has been made for the tails at relative 2.5PN order in [1]. At relative 2PN order we have (using the notation of the paper)

$$M = m \left[ 1 - \frac{\nu}{2}\gamma + \frac{\nu}{8}(7 - \nu)\gamma^2 + \mathcal{O}\left(\frac{1}{c^6}\right) \right]. \quad (1)$$

These corrections affect the tails at 2.5PN and 3.5PN orders for compact binaries. As a result equations (5.5a) and (5.5b) are changed to

$$\mathcal{L}_{\text{tail}} = \frac{32c^5}{5G} v^2 \gamma^5 \left\{ 4\pi \gamma^{3/2} - \left( \frac{25663}{672} + \frac{125}{8} \nu \right) \pi \gamma^{5/2} + \left( \frac{90205}{576} + \frac{505747}{1512} \nu + \frac{12809}{756} \nu^2 \right) \pi \gamma^{7/2} + \mathcal{O}(\gamma^4) \right\}, \quad (2)$$

$$\mathcal{L}_{\text{tail}} = \frac{32c^5}{5G} v^2 x^5 \left\{ 4\pi x^{3/2} - \left( \frac{8191}{672} + \frac{583}{24} \nu \right) \pi x^{5/2} + \left( -\frac{16285}{504} + \frac{214745}{1728} \nu + \frac{193385}{3024} \nu^2 \right) \pi x^{7/2} + \mathcal{O}(x^4) \right\}. \quad (3)$$

The tails-of-tails at 3PN order are not modified.

### References

- [1] Blanchet L 1996 *Phys. Rev. D* **54** 1417 (*Preprint gr-qc/9603048*)