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Corrigendum

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The contribution of tails in the waveform of gravitational waves from compact binaries at 2.5PN order has been incorrectly computed. The tails arise from interaction between the mass monopole moment M of the source and higher-order multipole moments. When replacing these moments into equation (3.14) 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 the ADM mass of the binary and therefore should involve relativistic corrections. The same error has been made for the tails at 2.5PN and 3.5PN orders in the gravitational flux in [1, 2].

The mass parameter m which appears in equations (3.4), (3.5), (3.7) and (3.14) should be the ADM mass M. The sentence after equation (3.6*b*) should read: In the above formulae, M is the total ADM mass of the binary system, which agrees with the mass monopole moment. In section 3.2, the mass m should read M. Since at relative 1PN order we have (using the notation of the paper)

$$M = m\left[1 - \frac{\nu}{2}x\right], \tag{1}$$

equations (4.37) and (5.6) should read respectively

$$\left(h_{+,\times}\right)_{\rm tail} = \left(k_{+,\times}\right)_{\rm tail} - 2\,x^{3/2}\left[1 - \frac{\nu}{2}x\right]\frac{\partial h_{+,\times}}{\partial\phi}\,\ln\left(\frac{\omega}{\omega_0}\right). \tag{2}$$

$$\psi = \phi - 2x^{3/2}\left[1 - \frac{\nu}{2}x\right]\ln\left(\frac{\omega}{\omega_0}\right). \tag{3}$$

The fourth sentence before equation (5.6) should read: Furthermore, the phase ψ given in [35] is *a priori* adequate up to only the 2PN order, but we have proved it to be also correct at the higher 2.5PN with the mass in front of the log-term being the ADM mass.

The third lines of both equations (4.38*a*) and (4.38*b*) are modified. The corrected complete equations are

$$\begin{aligned}
\left(k_+\right)_{\rm tail} = \frac{2\,G\,m\,\nu\,x}{c^2R}\Bigg\{&-2\pi x^{3/2}(1+c_i^2)\cos 2\phi \\
&+\frac{s_i}{40}\frac{\delta m}{m}x^2\Big[\big(11+7c_i^2+10(5+c_i^2)\ln 2\big)\sin\phi \\
&-5\pi(5+c_i^2)\cos\phi - 27[7-10\ln(3/2)](1+c_i^2)\sin 3\phi \\
&+135\pi(1+c_i^2)\cos 3\phi\Big] \\
&+x^{5/2}\Big[\frac{\pi}{3}\left(19+9c_i^2-2c_i^4+\nu(-16+14c_i^2+6c_i^4)\right)\cos 2\phi \\
&+\frac{1}{5}\left(-9+14c_i^2+7c_i^4+\nu(27-42c_i^2-21c_i^4)\right)\sin 2\phi
\end{aligned}$$

$$
-\frac{16\pi}{3}(1-c_i^4)\,(1-3\nu)\cos 4\phi
$$
$$
\left.\left.+\frac{8}{15}(1-c_i^4)(1-3\nu)\,(21-20\ln 2)\sin 4\phi\right]\right\}\,, \qquad (4a)
$$

$$
\left(k_\times\right)_{\mathrm{tail}} = \frac{2\,G\,m\,\nu\,x}{c^2 R}\left\{-4\pi x^{3/2} c_i \sin 2\phi\right.
$$
$$
-\frac{3\,s_i\,c_i}{20}\frac{\delta m}{m}x^2\,[(3+10\ln 2)\cos\phi+5\pi\sin\phi
$$
$$
-9[7-10\ln(3/2)]\cos 3\phi-45\pi\sin 3\phi]
$$
$$
+x^{5/2}\left[\frac{2\pi}{3}c_i\left(13+4\,s_i^2+\nu(2-12\,s_i^2)\right)\sin 2\phi\right.
$$
$$
+\frac{2}{5}c_i(1-3\nu)\left(-6+11\,s_i^2\right)\cos 2\phi
$$
$$
-\frac{32\pi}{3}c_i\,s_i^2(1-3\nu)\sin 4\phi
$$
$$
\left.\left.+\frac{16}{15}c_i\,s_i^2(1-3\nu)\,(-21+20\ln 2)\cos 4\phi\right]\right\}\,. \qquad (4b)
$$

The fourth line of equation (5.9) and the fifth line of (5.10) are modified. The corrected equations are

$$
H_+^{(2.5)} = s_i\frac{\delta m}{m}\cos\psi\left[\frac{1771}{5120}-\frac{1667}{5120}\,c_i^2+\frac{217}{9216}\,c_i^4-\frac{1}{9216}\,c_i^6\right.
$$
$$
+\nu\left(\frac{681}{256}+\frac{13}{768}\,c_i^2-\frac{35}{768}\,c_i^4+\frac{1}{2304}\,c_i^6\right)
$$
$$
\left.+\,\nu^2\left(-\frac{3451}{9216}+\frac{673}{3072}\,c_i^2-\frac{5}{9216}\,c_i^4-\frac{1}{3072}\,c_i^6\right)\right]
$$
$$
+\pi\cos 2\psi\left[\frac{19}{3}+3\,c_i^2-\frac{2}{3}\,c_i^4+\nu\left(-\frac{16}{3}+\frac{14}{3}\,c_i^2+2\,c_i^4\right)\right]
$$
$$
+s_i\frac{\delta m}{m}\cos 3\psi\left[\frac{3537}{1024}-\frac{22977}{5120}\,c_i^2-\frac{15309}{5120}\,c_i^4+\frac{729}{5120}\,c_i^6\right.
$$
$$
+\nu\left(-\frac{23829}{1280}+\frac{5529}{1280}\,c_i^2+\frac{7749}{1280}\,c_i^4-\frac{729}{1280}\,c_i^6\right)
$$
$$
\left.+\,\nu^2\left(\frac{29127}{5120}-\frac{27267}{5120}\,c_i^2-\frac{1647}{5120}\,c_i^4+\frac{2187}{5120}\,c_i^6\right)\right]
$$
$$
+\cos 4\psi\left[-\frac{16\pi}{3}\,(1+\,c_i^2)\,s_i^2(1-3\nu)\right]
$$
$$
+s_i\frac{\delta m}{m}\cos 5\psi\left[-\frac{108125}{9216}+\frac{40625}{9216}\,c_i^2+\frac{83125}{9216}\,c_i^4-\frac{15625}{9216}\,c_i^6\right.
$$
$$
+\nu\left(\frac{8125}{256}-\frac{40625}{2304}\,c_i^2-\frac{48125}{2304}\,c_i^4+\frac{15625}{2304}\,c_i^6\right)
$$
$$
\left.+\,\nu^2\left(-\frac{119375}{9216}+\frac{40625}{3072}\,c_i^2+\frac{44375}{9216}\,c_i^4-\frac{15625}{3072}\,c_i^6\right)\right]
$$
$$
+\frac{\delta m}{m}\cos 7\psi\left[\frac{117649}{46080}\,s_i^5(1+\,c_i^2)(1-4\nu+3\nu^2)\right]
$$

$$+\sin 2\psi\left[-\frac{9}{5}+\frac{14}{5}c_i^2+\frac{7}{5}c_i^4+\nu\left(\frac{96}{5}-\frac{8}{5}c_i^2-\frac{28}{5}c_i^4\right)\right]$$
$$+s_i^2(1+c_i^2)\sin 4\psi\left[\frac{56}{5}-\frac{32\ln 2}{3}-\nu\left(\frac{1193}{30}-32\ln 2\right)\right]. \quad (5)$$

$$H_\times^{(2.5)}=\frac{6}{5}s_i^2 c_i \nu$$
$$+c_i\cos 2\psi\left[2-\frac{22}{5}c_i^2+\nu\left(-\frac{154}{5}+\frac{94}{5}c_i^2\right)\right]$$
$$+c_i s_i^2\cos 4\psi\left[-\frac{112}{5}+\frac{64}{3}\ln 2+\nu\left(\frac{1193}{15}-64\ln 2\right)\right]$$
$$+s_i c_i\frac{\delta m}{m}\sin\psi\left[-\frac{913}{7680}+\frac{1891}{11520}c_i^2-\frac{7}{4608}c_i^4\right.$$
$$+\nu\left(\frac{1165}{384}-\frac{235}{576}c_i^2+\frac{7}{1152}c_i^4\right)$$
$$\left.+\nu^2\left(-\frac{1301}{4608}+\frac{301}{2304}c_i^2-\frac{7}{1536}c_i^4\right)\right]$$
$$+\pi c_i\sin 2\psi\left[\frac{34}{3}-\frac{8}{3}c_i^2-\nu\left(\frac{20}{3}-8c_i^2\right)\right]$$
$$+s_i c_i\frac{\delta m}{m}\sin 3\psi\left[\frac{12501}{2560}-\frac{12069}{1280}c_i^2+\frac{1701}{2560}c_i^4\right.$$
$$+\nu\left(-\frac{19581}{640}+\frac{7821}{320}c_i^2-\frac{1701}{640}c_i^4\right)$$
$$\left.+\nu^2\left(\frac{18903}{2560}-\frac{11403}{1280}c_i^2+\frac{5103}{2560}c_i^4\right)\right]$$
$$+s_i^2 c_i\sin 4\psi\left[-\frac{32\pi}{3}(1-3\nu)\right]$$
$$+\frac{\delta m}{m}s_i c_i\sin 5\psi\left[-\frac{101875}{4608}+\frac{6875}{256}c_i^2-\frac{21875}{4608}c_i^4\right.$$
$$+\nu\left(\frac{66875}{1152}-\frac{44375}{576}c_i^2+\frac{21875}{1152}c_i^4\right)$$
$$\left.+\nu^2\left(-\frac{100625}{4608}+\frac{83125}{2304}c_i^2-\frac{21875}{1536}c_i^4\right)\right]$$
$$+\frac{\delta m}{m}s_i^5 c_i\sin 7\psi\left[\frac{117649}{23040}\left(1-4\nu+3\nu^2\right)\right]. \quad (6)$$

In section 5.3, the last sentence of the third paragraph should read: We also have to compute the remainder terms $\mathcal{O}(3)$ in the corresponding expressions of U_{ijklm} and V_{ijkl}.

References

[1] Blanchet L 1996 *Phys. Rev.* D **54** 1417 (*Preprint* gr-qc/9603048)
[2] Blanchet L 1998 *Class. Quantum Grav.* **15** 113 (*Preprint* gr-qc/9710038)