

# Erratum: Semirelativistic approximation to gravitational radiation from encounters with nonspinning black holes [Phys. Rev. D **72**, 084009 (2005)]

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There are two minor errors in Sec. II B; these are not propagated. Equation (14) is missing a leading minus sign, and equation (15) is missing an overall factor of  $M$ .

There are a number of errors in the formula given for changes in energy and angular momentum in Sec. III D

and Appendix A I. These have no further consequences.

In equation (35) the function multiplying the elliptic integral  $\mathbf{K}$  should be  $f_2(r_p/M)$  not  $f_1(r_p/M)$ . The second polynomial defined for (37) should be

$$g_2(y) = 71285760 - 324389184y + 468548880y^2 - 277856496y^3 + 54521424y^4 + 6181872y^5 - 1630457y^6 - 238086y^7 - 31776y^8 - 4120y^9, \quad (1)$$

with a positive coefficient for  $y^2$ . The polynomial defined for equation (A3) contains several sign errors, it should be

$$\begin{aligned} f_1(y, e) = & 4608(1-e)(1+e)^2 (3+e^2)^2 (2428691599 + 313957879e^2 + 1279504693e^4 \\ & + 63843717e^6) - 192(1+e)^2 (908960573673 - 155717471796e^2 \\ & - 88736969547e^4 - 293676299040e^6 - 195313674237e^8 - 26635698156e^{10} \\ & - 346799201e^{12}) y + 384(1+e)^3 (336063804453 - 53956775638e^2 - 33318942522e^4 \\ & - 92857670352e^6 - 41764459155e^8 - 2765710514e^{10}) y^2 \\ & - 16(1+e)^4 (341890705555 - 580720618635e^2 - 168432860626e^4 \\ & - 606890963686e^6 - 176495184865e^8 - 3768291999e^{10}) y^3 \\ & + 32(1+e)^5 (510454645597 - 92175635794e^2 + 26432814256e^4 - 28250211070e^6 \\ & - 5713846269e^8) y^4 - 4(1+e)^6 (1107402703901 - 174239346926e^2 \\ & + 100957560852e^4 + 3707280110e^6 - 899162673e^8) y^5 \\ & + 8(1+e)^7 (143625217397 - 16032820010e^2 + 4238287541e^4 + 275190560e^6) y^6 \\ & - (1+e)^8 (220627324753 - 14884378223e^2 - 1210713997e^4 + 14138955e^6) y^7 \\ & + 8(1+e)^9 (2922108518 - 46504603e^2 - 2407656e^4) y^8 \\ & - 3(1+e)^{10} (241579935 + 6314675e^2 - 149426e^4) y^9 \\ & - 4(1+e)^{11} (8608805 - 48992e^2) y^{10} - 2(1+e)^{12} (1242083 - 16320e^2) y^{11} \\ & - 184320(1+e)^{13} y^{12} - 5120(1+e)^{14} y^{13}. \end{aligned} \quad (2)$$

The Taylor expansion in (A5) for the change in energy should have  $192\pi/5$  as the numerical prefactor for the  $(r_p/M)^{-9/2}$  term and not  $64\pi/5$ .

Additionally, there are additional typographical mis-

takes. Equation (40) should read

$$\frac{M}{m} \Delta X \approx p_X \ln \left( \frac{r_p}{M} - 4 \right) + q_X + O \left( \frac{r_p}{M} - 4 \right), \quad (3)$$

and equation (43)

$$\frac{M}{m} \Delta X = \sum_{n=0}^{N_X} -A_n^X \ln \left( \frac{r_p}{M} - 4 \right) + A_n^X \ln(2B_n^X) + O \left( \frac{r_p}{M} - 4 \right). \quad (4)$$

Equation (A4) should read

$$\begin{aligned}
\frac{\Delta L}{m} = & -\frac{16M^{15/2}}{24249225(1+e)^{13/2}r_p^{7/2}(r_p-2M)^2[(1+e)r_p-2(1-e)M]^2} \\
& \times \left[ \sqrt{(1+e)\frac{r_p}{M}-2(3-e)} \mathbf{E} \left( \sqrt{\frac{4eM}{(1+e)r_p-2(3-e)M}} \right) g_1 \left( \frac{r_p}{M}, e \right) \right. \\
& \left. + \frac{1+e}{\sqrt{(1+e)\frac{r_p}{M}-2(3-e)}} \mathbf{K} \left( \sqrt{\frac{4eM}{(1+e)r_p-2(3-e)M}} \right) g_2 \left( \frac{r_p}{M}, e \right) \right], \tag{5}
\end{aligned}$$

the  $M$  in the argument of  $\mathbf{K}$  was previously omitted.

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