

Erratum: Incorporating post-Newtonian effects in N -body dynamics
[Phys. Rev. D **89, 044043 (2014)]**

Clifford M. Will

(Received 30 December 2014; published 13 January 2015)

DOI: [10.1103/PhysRevD.91.029902](https://doi.org/10.1103/PhysRevD.91.029902)

PACS numbers: 98.62.Js, 04.25.Nx, 99.10.Cd

Because of an improper resubstitution of lower-order solutions to the Lagrange planetary equations to obtain the effects of post-Newtonian “cross terms” in the hierarchical three-body problem (only periodic terms in the solutions should be substituted, not the secularly growing terms), the final equations for the secular evolution of the orbit elements e (eccentricity) and ι (inclination), Eqs. (4.14b) and (4.14c) of [1], were in error. The correct equations read

$$\langle \Delta e \rangle_{\text{Cross}} = -\frac{15\pi Gm_3}{8} \frac{(a)^3}{ac^2} \left[\frac{(1+e)^2}{(1-e)(1-e^2)^{1/2}} \{ (3+7e) - (1+6e)\eta - f(e,\eta) \} + \frac{4(1-e)^2(2+4e-3e^2)}{e^3} \right] \sin 2\omega \sin^2 \iota,$$

$$\langle \Delta \iota \rangle_{\text{Cross}} = -\frac{15\pi Gm_3}{8} \frac{(a)^3}{ac^2} \left[\frac{e(1+e)^2}{(1-e)(1-e^2)^{3/2}} \{ (3+7e) - (1+6e)\eta + f(e,\eta) \} - \frac{8(1-e)^3(1+3e)}{e^2(1-e^2)} \right] \sin 2\omega \sin \iota \cos \iota,$$

where $f(e,\eta)$ and $g(e,\eta)$ are given by Eqs. (4.15) of [1]. The terms proportional to $\cos 2\omega$ of the original versions of Eqs. (4.14b) and (4.14c) should be deleted. The same correction should be applied to Eqs. (25) and (26) of [2]. This correction does not alter any of the conclusions of these papers.

ACKNOWLEDGMENTS

We are grateful to Scott Tremaine and Bence Kocsis for pertinent questions that led to the discovery of this error. This work was supported in part by the National Science Foundation, Grant No. 13-06069.

- [1] C. M. Will, *Phys. Rev. D* **89**, 044043 (2014).
 [2] C. M. Will, *Classical Quantum Gravity* **31**, 244001 (2014).