

Erratum: Modeling ringdown: Beyond the fundamental quasinormal modes [Phys. Rev. D **90**, 124032 (2014)]

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While we currently present corrections and modifications to a subset of the tables, equations, and figures, the work's core findings and conclusions do not change. Here, we modify the fitting formula, update plots containing overtones, and make corrections to appropriate equations. We have provided a public IPython notebook to accompany this erratum on github [1].

The algorithm used to generate Tables IV and V, as well as Eqs. (2)–(7) were found to be affected by an indexing error, through which the remnant black hole spin was erroneously equated with the remnant's mass. In addition, the authors now choose to modify the fitting ansatz given by Eq. (38) and (A2) such that overall factors of the symmetric mass ratio η do not increase with overtone number. This is motivated by the linearity of the first-order quasinormal modes as $\eta \rightarrow 0$, and is consistent with Eq. (35) of the paper. Correcting the indexing error, and enforcing the more appropriate fitting ansatz for the overtones results in Eqs. (1)–(9).

$$A_{220}(\eta) = \omega_{220}^2 (0.9252e^{0.0000i}\eta + 0.1323e^{0.0000i}\eta^2) \quad (1)$$

$$A_{221}(\eta) = \omega_{221}^2 (0.1275e^{5.3106i}\eta + 1.1882e^{0.4873i}\eta^2 + 8.2709e^{3.3895i}\eta^3 + 26.2329e^{0.1372i}\eta^4) \quad (2)$$

$$A_{210}(\eta) = \omega_{210}^2 \sqrt{1-4\eta} (0.4795e^{3.5587i}\eta + 1.1736e^{1.5679i}\eta^2 + 1.2303e^{6.0496i}\eta^3) \quad (3)$$

$$A_{330}(\eta) = \omega_{330}^2 \sqrt{1-4\eta} (0.4247e^{5.4979i}\eta + 1.4742e^{3.6524i}\eta^2 + 4.3139e^{6.0787i}\eta^3 + 15.7264e^{3.2053i}\eta^4) \quad (4)$$

$$A_{331}(\eta) = \omega_{331}^2 \sqrt{1-4\eta} (0.1480e^{2.9908i}\eta + 1.4874e^{0.5635i}\eta^2 + 10.1637e^{4.2348i}\eta^3 + 29.4786e^{1.7619i}\eta^4) \quad (5)$$

$$A_{320}(\eta) = \omega_{320}^2 (0.1957e^{5.8008i}\eta + 1.5830e^{3.2194i}\eta^2 + 5.0338e^{0.6843i}\eta^3 + 3.7366e^{4.1217i}\eta^4) \quad (6)$$

$$A_{440}(\eta) = \omega_{440}^2 (0.2531e^{1.5961i}\eta + 2.4040e^{5.1851i}\eta^2 + 14.7273e^{1.9953i}\eta^3 + 67.3624e^{4.9143i}\eta^4 + 126.5858e^{1.8502i}\eta^5) \quad (7)$$

$$A_{430}(\eta) = \omega_{430}^2 \sqrt{1-4\eta} (0.0938e^{3.2607i}\eta + 0.8273e^{0.7704i}\eta^2 + 3.3385e^{4.8264i}\eta^3 + 4.6639e^{2.7047i}\eta^4) \quad (8)$$

$$A_{550}(\eta) = \omega_{550}^2 \sqrt{1-4\eta} (0.1548e^{5.3772i}\eta + 1.5091e^{2.5764i}\eta^2 + 8.9333e^{5.5995i}\eta^3 + 42.3431e^{2.1269i}\eta^4 + 89.1947e^{5.3348i}\eta^5) \quad (9)$$

Related figure changes.—The changes above superficially affect Figs. 7–9, 12, and 14. Updated figures cannot be distinguished from those present in the paper; therefore, they will not be amended here.

Other comments.—The equation just prior to Eq. (32) is missing a factor of 2 in its exponent and thus should read $\tilde{\omega}_{lmn}^2 = |\tilde{\omega}_{lmn}|^2 e^{-2\varphi_{lmn}}$. The first line of Eq. (32) should contain $\tilde{\omega}_{lmn}^2$ not $\tilde{\omega}_{nlm}^2$. In Eqs. (1)–(9) here, the authors choose to omit the $(l, m, n) \in \{(5, 4, 0), (2, 2, 2)\}$ quasinormal modes due to data quality concerns.

[1] L. London, [arXiv:1404.3197](https://arxiv.org/abs/1404.3197); <https://github.com/london6/erratum-arXiv-1404.3197>.