Erratum: Distinguishing binary black hole precessional morphologies with gravitational wave observations [Phys. Rev. D 108, 103003 (2023)]

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While performing a follow-up study, we found that the upper cutoff frequency used for the analysis of the $20M_\odot$ $\chi_1 = \chi_2 = 0.95$ Lπ boundary case with SNR 89 was mistakenly set to 448 Hz (as was used for the analysis of the $75M_\odot$ cases), when it should have been 896 Hz. There is an increase of 1.6 in the median matched-filter SNR for the analysis with no restriction on the morphology when using the correct upper cutoff frequency. The full nested sampling analysis with the correct upper cutoff frequency gives $\log_{10}$ Bayes factors that are a bit less than 2 larger than those obtained with the smaller upper cutoff frequency. We show the corrected results in the updated version of Fig. 1. This figure also shows the importance sampling results using the correct upper cutoff frequency, where $\log_{10} \mathrm{BF}^{\mathrm{L}\pi}_{\mathrm{C}}$ is unchanged within the estimated uncertainties, while there is an increase of ∼8 in $\log_{10} \mathrm{BF}^{\mathrm{L}\pi}_{\mathrm{L0}}$, which makes its value significantly larger than the full nested sampling result, similar to the $\mathrm{BF}^{\mathrm{L0}}_{\mathrm{L}\pi}$ results for the L0 central and L0 boundary cases as well as the $\mathrm{BF}^{\mathrm{L0}}_{\mathrm{C}}$ result in the L0 central case. The discussion in the paper of a possible reason why $\mathrm{BF}^{\mathrm{L}\pi}_{\mathrm{L0}}$ is larger for the Lπ boundary case than the Lπ central case still holds with the results using the correct upper cutoff frequency, and none of the conclusions of the paper are changed.

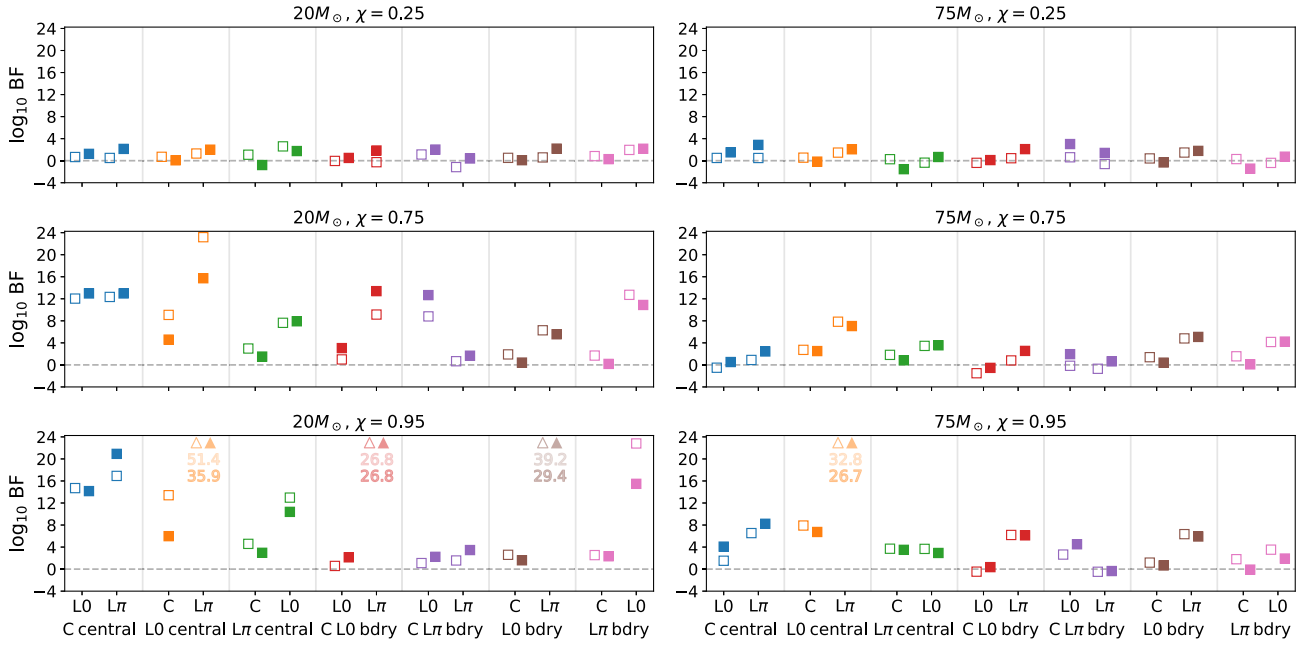

FIG. 1. The $\log_{10}$ Bayes factors in favor of the true morphology compared to the two alternative morphologies for SNR 89 BBHs. We give the true morphology on the bottom of the horizontal axis (abbreviating "boundary" to "bdry") and the two alternative morphologies above it. For an explicit example, the leftmost Bayes factor plotted is $\log_{10} \mathrm{BF}^{\mathrm{C}}_{\mathrm{L0}}$. We show the results from the nested sampling calculation with filled markers and the importance weights method with unfilled markers. We also use triangles for the cases where both calculations give much larger Bayes factors than the other cases, so the values lie off of the plotted regions, and provide their $\log_{10}$ Bayes factor values. All the nested sampling $\log_{10}$ Bayes factors have errors of ± 0.2, while the importance weights results have errors of at most ± 0.6, but none of these are visible on the scale of this plot.

