

**Erratum: Low-frequency gravitational waves
in three-dimensional core-collapse supernova models
[Phys. Rev. D **112**, 123025 (2025)]**

Colter J. Richardson[✉], Anthony Mezzacappa[✉], Kya Schluterman, Haakon Andresen[✉],
Eric J. Lentz[✉], Pedro Marronetti[✉], R. Daniel Murphy[✉], and Michele Zanolin



(Received 1 June 2026; published 30 June 2026)

DOI: [10.1103/43vq-s34w](https://doi.org/10.1103/43vq-s34w)

The neutrino-induced gravitational waveforms presented in original article were computed incorrectly. They were underestimated by a factor of 4π . While the results are impacted, the original conclusions are not. In fact, they are only reinforced. The corrected versions of Figs. 5–7, 11–16, and 19 are given here. The captions of Figs. 5–7, 11, 12, 16, and 19 are not modified. The captions of Figs. 13–15 are corrected to the fit parameters for the corrected waveforms. The corrected versions of Tables I–III are given here. There is no correction to the captions.

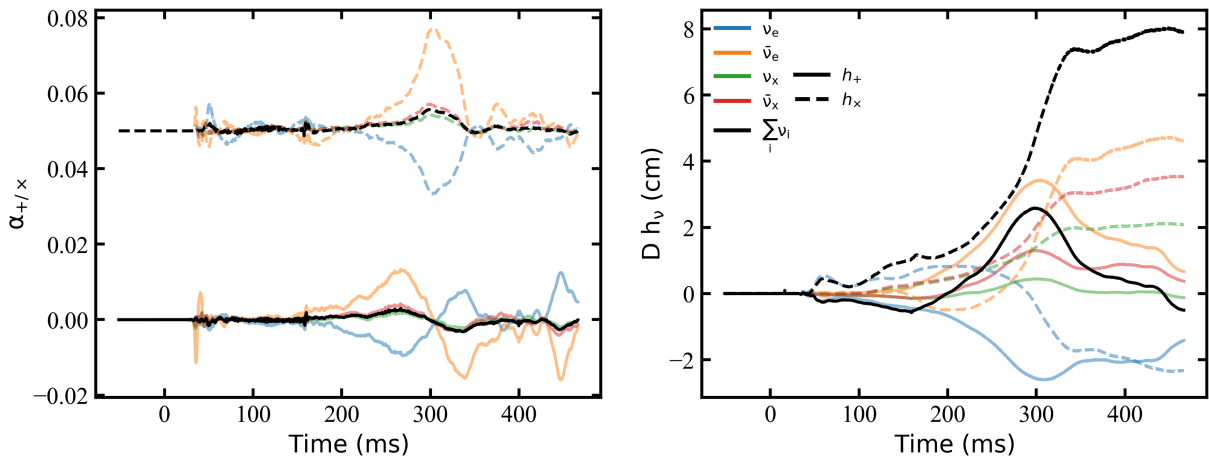


FIG. 5. The anisotropy (left) and strain (right) for the plus (solid) and cross (dashed and y-shifted) polarizations for the polar axis and the D9.6-3D model. The contribution of each species independently is delineated by color, and the total is delineated in black.

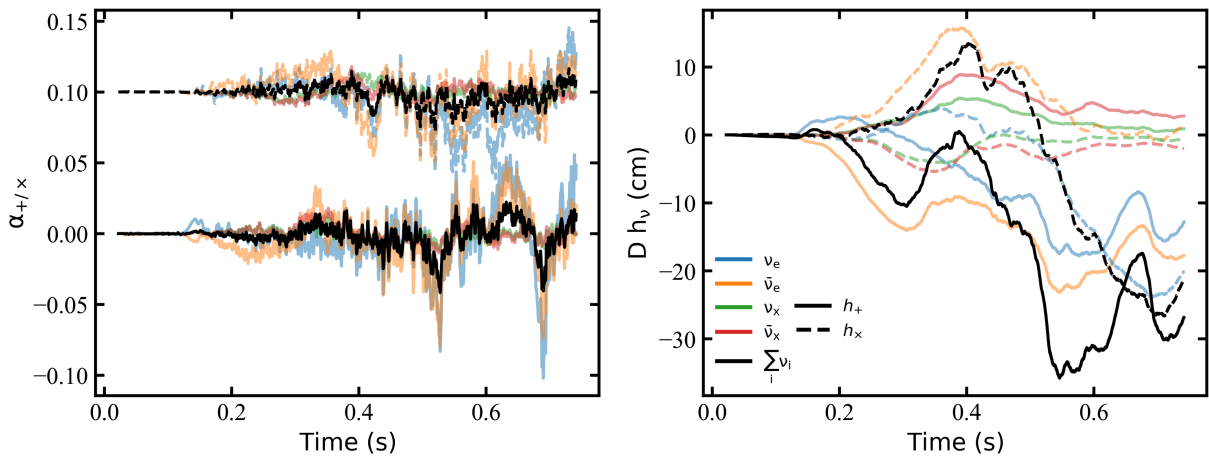


FIG. 6. The anisotropy (left) and strain (right) for the plus (solid) and cross (dashed and y-shifted) polarizations for the polar axis and the D15-3D model. The contribution of each species independently is delineated in color, and the total is delineated in black.

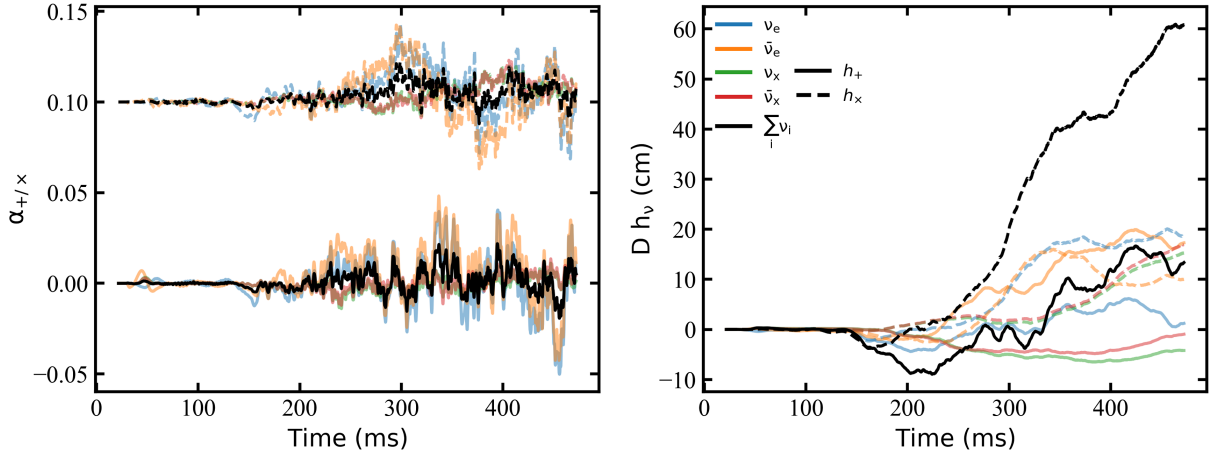


FIG. 7. The anisotropy (left) and strain (right) for the plus (solid) and cross (dashed and y-shifted) polarizations for the polar axis and the D25-3D model. The contribution of each species independently is delineated in color, and the total is delineated in black.

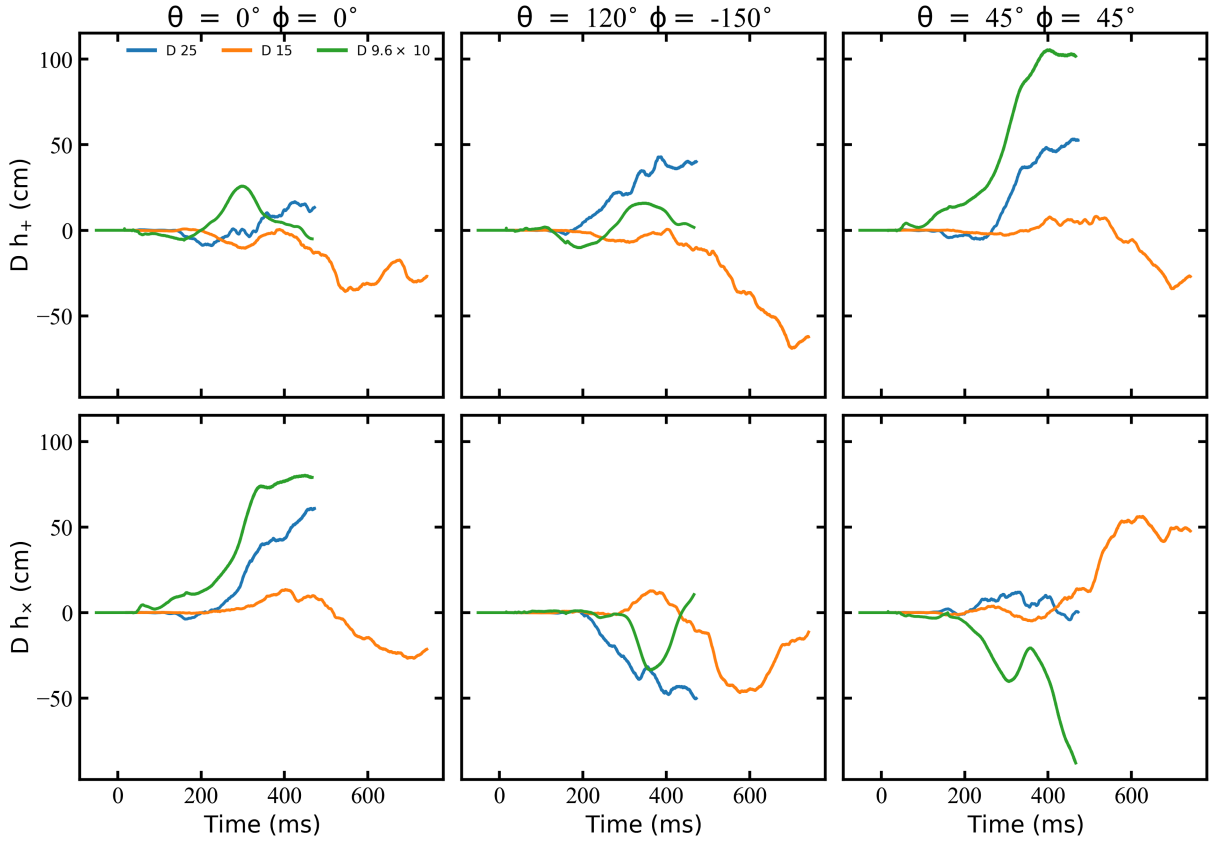


FIG. 11. Gravitational waves sourced from the anisotropy of neutrino emission in our core-collapse supernova models. The top row shows the plus polarization at the source. The bottom row shows the cross-polarization at the source. Each column shows the different signals at a specific observer orientation with respect to the source frame. Note the significantly lower amplitude signal from the D9.6-3D model, which indicates a more spherical explosion.

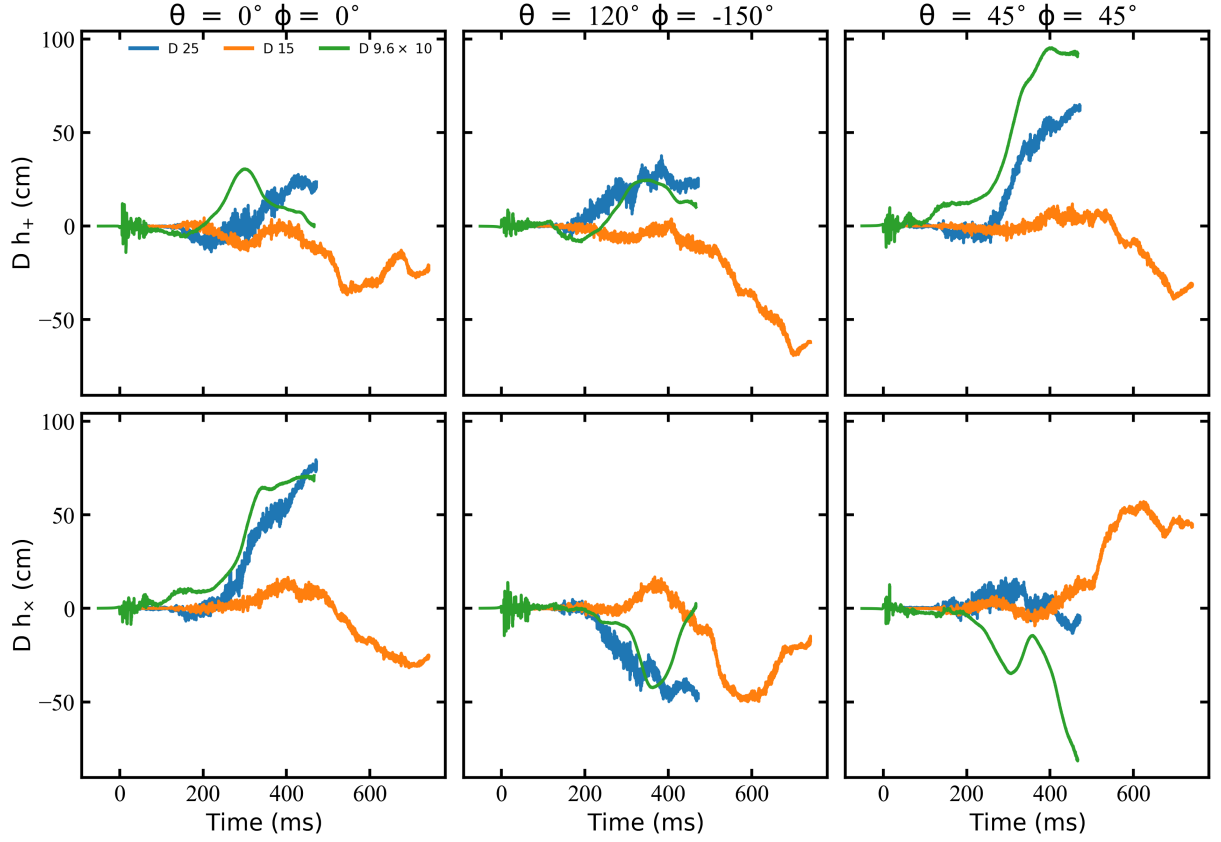


FIG. 12. Gravitational waves sourced from the fluid and the neutrinos in our core-collapse supernova models. The top row shows the plus polarization at the source. The bottom row shows the cross-polarization at the source. Each column shows the different signals at a specific observer orientation with respect to the source frame. Note the significantly lower amplitude signal from the D9.6-3D model, which indicates a more spherical explosion.

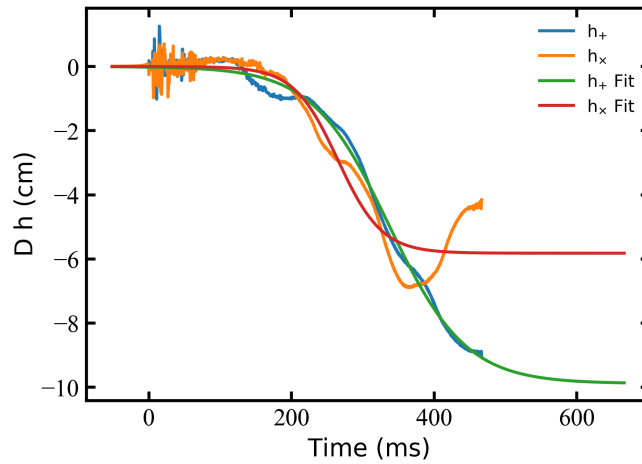


FIG. 13. Logistic fit to the total gravitational wave signal from D9.6-3D. For the plus polarization, the values of the fit parameters are $k = 18.60 \pm 0.11$ Hz and $L = -9.88 \pm 0.06$ cm. For the cross-polarization, the fit parameters are $k = 32.38 \pm 0.70$ Hz and $L = -5.82 \pm 0.03$ cm.

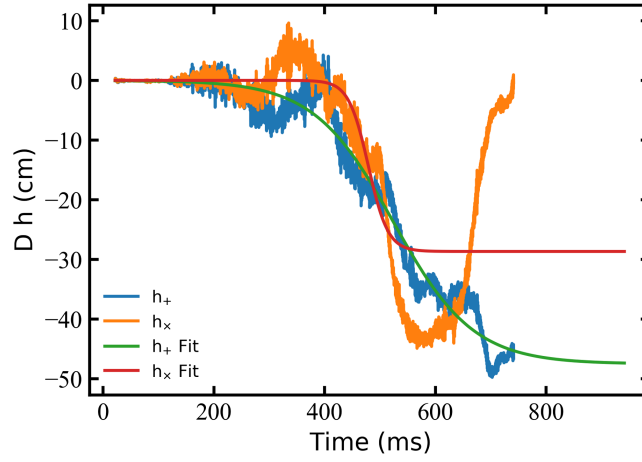


FIG. 14. Logistic fit to the total gravitational wave signal from D15-3D. For the plus polarization, the values of the fit parameters are $k = 13.91 \pm 0.15$ Hz and $L = -47.53 \pm 0.25$ cm. For the cross-polarization, the fit parameters are $k = 56.18 \pm 4.17$ Hz and $L = -28.69 \pm 0.28$ cm.

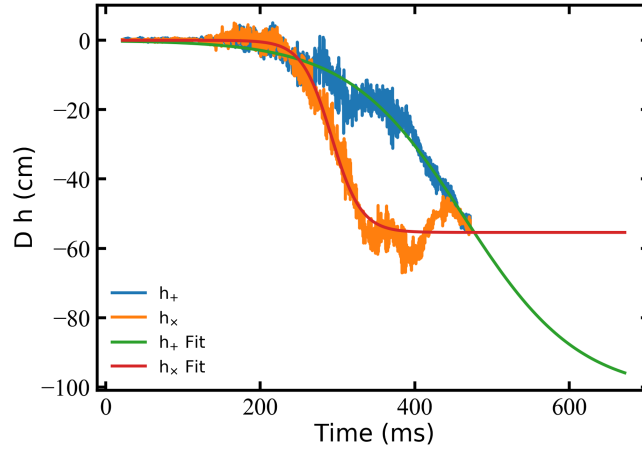


FIG. 15. Logistic fit to the total gravitational wave signal from D25-3D. For the plus polarization, the values of the fit parameters are $k = 13.39 \pm 0.22$ Hz and $L = -101.83 \pm 4.36$ cm. For the cross-polarization, the fit parameters are $k = 51.97 \pm 0.75$ Hz and $L = -55.41 \pm 0.14$ cm.

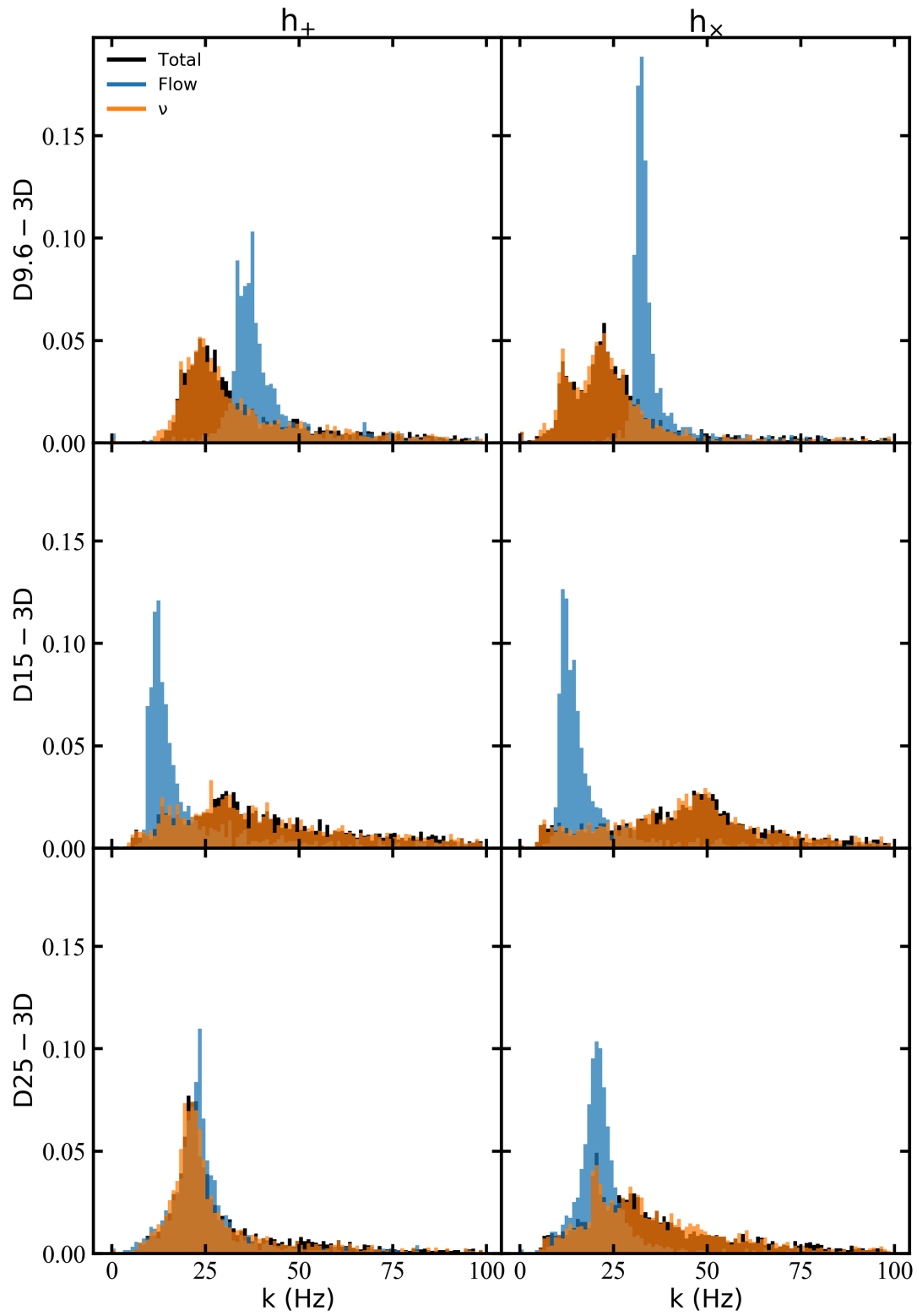


FIG. 16. A histogram of the probability density of the fit frequency in the logistic function, as a function of frequency, for each model at different observer orientations.

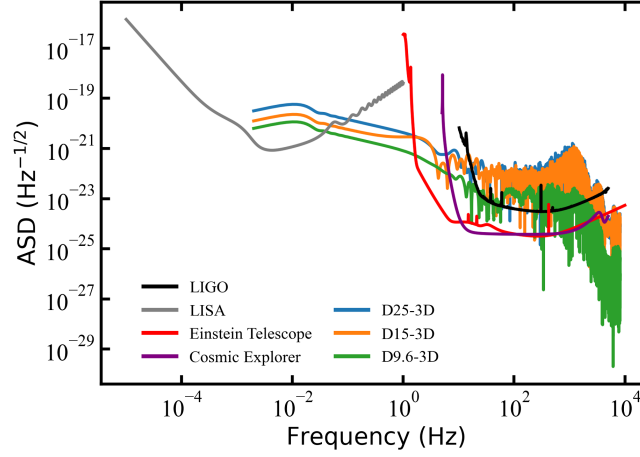


FIG. 19. The amplitude spectral density (ASD) of waveforms from our three models at 1 kpc, after a 10000 second extension and tapering, compared to the noise of LIGO's O3 run and the predicted noise of LISA, Cosmic Explorer, and Einstein Telescope.

TABLE I. Average and standard deviation of the gravitational wave ramp-up frequency (in Hz) from different sources in each model, corresponding to the distributions shown in Fig. 16.

Model	Source	$D h_+$	$D h_\times$
D9.6-3D	Flow	45.72 ± 26.69	40.20 ± 24.16
	Neutrino	43.96 ± 35.73	48.98 ± 55.976
	Total	43.65 ± 33.98	50.38 ± 55.68
D15-3D	Flow	41.70 ± 55.91	49.43 ± 65.06
	Neutrino	60.87 ± 51.03	56.63 ± 40.03
	Total	61.87 ± 50.75	55.96 ± 38.63
D25-3D	Flow	34.63 ± 39.07	33.88 ± 43.76
	Neutrino	40.98 ± 43.61	50.75 ± 45.25
	Total	39.58 ± 38.84	49.61 ± 44.63

TABLE II. Average and standard deviation of the gravitational wave amplitude (in cm) from different sources in each model.

Model	Source	$D h_+$	$D h_\times$
D9.6-3D	Flow	0.75 ± 0.41	0.80 ± 0.46
	Neutrino	7.41 ± 4.06	6.63 ± 3.78
	Total	7.69 ± 4.23	6.50 ± 3.73
D15-3D	Flow	6.10 ± 4.83	5.13 ± 4.39
	Neutrino	31.19 ± 21.34	32.31 ± 23.93
	Total	30.01 ± 19.81	32.30 ± 23.36
D25-3D	Flow	11.04 ± 6.50	9.75 ± 6.35
	Neutrino	67.20 ± 53.94	54.94 ± 51.42
	Total	70.34 ± 57.04	57.84 ± 54.97

TABLE III. Projected signal-to-noise ratios for our waveforms in predicted noise for LIGO, LISA, Einstein Telescope, and Cosmic Explorer, injected at 1 kiloparsec.

Model	LIGO	LISA	ET	CE
D9.6-3D	13	13	136	91
D15-3D	94	27	943	1063
D25-3D	142	69	1589	1269

Finally, the authors would like to acknowledge Lella *et al.* [1] for pointing out the discrepancy between our computed neutrino-induced waveforms and theirs, which prompted us to investigate the discrepancy and which led to the discovery of our error.

- [1] A. Lella, G. Lucente, D. Kresse, R. Glas, H.-T. Janka, and A. Mirizzi, Gravitational-wave signals for supernova explosions of three-dimensional progenitors, [Phys. Rev. D **113**, 083034 \(2026\)](#).