

Table 1: Intrinsic parameters of the simulation (at $t = 0$). Q , M_{NS} , m_0 , $\Omega_{22,0}$, i_{tilt} and χ_i ($i = x, y, z$) denote the mass ratio, the NS mass, the total mass in the isolation, the angular frequency of the $(l, m) = (2, 2)$ gravitational waves observed from the direction of the maximum emission, the spin orientation is defined by the angle between the black-hole spin and the direction of the maximum emission, and the components of the dimensionless spin, respectively.

Model	Q	$M_{\text{NS}} [M_{\odot}]$	$m_0 [M_{\odot}]$	EOS	$m_0 \Omega_{22,0}$	$i_{\text{tilt}} [\text{rad.}]$	χ_x	χ_y	χ_z
APR4i30N48	5	1.35	8.1	APR4	0.0734	0.54	0.16	0.35	0.64
APR4i60N60	5	1.35	8.1	APR4	0.0719	1.05	0.30	0.58	0.37
APR4i90N60	5	1.35	8.1	APR4	0.0713	1.57	0.39	0.64	0.00
ALF2i30N60	5	1.35	8.1	ALF2	0.0732	0.54	0.16	0.35	0.64
ALF2i60N60	5	1.35	8.1	ALF2	0.0721	1.05	0.30	0.58	0.37
ALF2i90N60	5	1.35	8.1	ALF2	0.0718	1.57	0.40	0.63	0.00
H4i30N60	5	1.35	8.1	H4	0.0737	0.53	0.16	0.35	0.65
H4i60N60	5	1.35	8.1	H4	0.0723	1.05	0.30	0.57	0.38
H4i90N60	5	1.35	8.1	H4	0.0719	1.57	0.40	0.63	0.00
MS1i30N48	5	1.35	8.1	MS1	0.0754	0.53	0.16	0.35	0.65
MS1i60N60	5	1.35	8.1	MS1	0.0724	1.05	0.30	0.57	0.38
MS1i90N60	5	1.35	8.1	MS1	0.0718	1.57	0.40	0.63	0.00

Data files in “gwf_J/” are the $l = 2$ waveforms in the frame that the initial total angular momentum agrees with the z -axis of the simulation. Data files in “gwf_Z/” are the $l = 2$ waveforms in the frame that the direction of the maximum emission at $t = 0$ agrees with the z -axis and the initial separation vector from the NS to the BH to align with the x -axis.

The first, second and third column in each data file denote the time normalized by m_0 , the real part of Dh_{lm}/m_0 , and the imaginary part of Dh_{lm}/m_0 , respectively.

Table 2: The key quantities for piecewise polytropic EOSs [J. Read et. al 2009] which we employ in the simulations. P_2 is the pressure at $\rho = \rho_2$ shown in the unit of dyne/cm², Γ_i is the adiabatic index for each piecewise polytrope, and M_{max} is the maximum mass of the spherical NS for a given EOS. $R_{1.35}$, $\rho_{1.35}$, $M_{*,1.35}$, and $\mathcal{C}_{1.35}$ are the radius, the central rest-mass density, the baryon rest mass, and the compactness parameter for the NS with $M_{\text{NS}} = 1.35M_{\odot}$, respectively.

Model	$\log_{10} P_2$	Γ_2	Γ_3	Γ_4	$M_{\text{max}} [M_{\odot}]$	$R_{1.35} [\text{km}]$	$\rho_{1.35} [\text{g/cm}^3]$	$M_{*,1.35} [M_{\odot}]$	$\mathcal{C}_{1.35}$
APR4	34.269	2.830	3.445	3.348	2.20	11.1	8.9×10^{14}	1.50	0.180
ALF2	34.616	4.070	2.411	1.890	1.99	12.4	6.4×10^{14}	1.49	0.161
H4	34.669	2.909	2.246	2.144	2.03	13.6	5.5×10^{14}	1.47	0.147
MS1	34.858	3.224	3.033	1.325	2.77	14.4	4.2×10^{14}	1.46	0.138