

# GW170814: FACTSHEET

observed by	H1, L1, V1	duration from 30 Hz	~ 0.26 to 0.28 s
source type	black hole (BH) binary	# of cycles from 30 Hz	~ 15 to 16
date	14 Aug 2017	credible region sky area (with V1)	60 deg <sup>2</sup>
time	10:30:43 UTC	credible region sky area (without V1)	1160 deg <sup>2</sup>
online trigger latency	~ 30 s	latitude, longitude (at time of arrival)	45° S, 73° W
signal arrival time delay	at L1 8 ms before H1 and 14 ms before V1	sky location	in direction of Eridanus constellation
signal-to-noise ratio	18	*RA, Dec	03 <sup>h</sup> 11 <sup>m</sup> , -44°57 <sup>m</sup>
false alarm rate	≲ 1 in 27 000 years	Peak GW strain (10 <sup>-22</sup> ) (H1, L1, V1)	~ 6, 6, 5
probability of noise producing V1 SNR peak	0.3%	peak stretching of interferometer arm (H1, L1, V1)	~ ± 1.2, 1.2, 0.8 am
distance	1.1 to 2.2 billion light-years	frequency at peak GW strain	155 to 203 Hz
redshift	0.07 to 0.14	wavelength at peak GW strain	1480 to 1930 km
total mass	53 to 59 M <sub>⊙</sub>	peak GW luminosity	3.2 to 4.2 × 10 <sup>56</sup> erg s <sup>-1</sup>
primary BH mass	28 to 36 M <sub>⊙</sub>	radiated GW energy	2.4 to 3.1 M <sub>⊙</sub> c <sup>2</sup>
secondary BH mass	21 to 28 M <sub>⊙</sub>	remnant ringdown freq.	312 to 345 Hz
mass ratio	0.6 to 1.0	remnant damping time	3.1 to 3.6 ms
remnant BH mass	51 to 56 M <sub>⊙</sub>	consistent with general relativity?	passes all tests performed
remnant BH spin	0.65 to 0.77	evidence for dispersion of GWs	none
remnant size (effective radius)	139 to 153 km		
remnant area	2.4 to 2.9 × 10 <sup>5</sup> km <sup>2</sup>		
effective spin parameter	-0.06 to 0.18		
effective precession spin parameter	unconstrained		

Parameter ranges correspond to 90% credible intervals.

L1/H1=LIGO Livingston/Hanford, V1=Virgo, am=attometer=10<sup>-18</sup> m, M<sub>⊙</sub>=1 solar mass=2 × 10<sup>30</sup> kg

Background Images (H1, L1, V1 from left to right): time-frequency trace (top), sky maps (middle), and time series with reconstructed waveforms from modeled and un-modeled searches (bottom)

\* Maximum a Posteriori estimates