GW170104: FACTSHEET

Background Images: time-frequency trace (top), H1 and L1 time series and maximum-likelihood binary black hole model (middle top), residuals between data and best-fit model (middle bottom), reconstructed waveforms from wavelet and binary black hole analyses (bottom)

observed by	LIGO L1, H1	duration from 30 Hz	~ 0.25 to 0.31 s
source type	black hole (BH) binary	# of cycles from 30 Hz	~ 14 to 16
date	04 Jan 2017	signal arrival time delay	arrived at H1 3 ms before L1
time	10:11:58.6 UTC		
signal-to-noise ratio	13	credible region sky area	1200 sq. deg.
false alarm rate	< 1 in 70,000 years	peak GW strain	~ 5×10^{-22}
probability of astrophysical origin	> 0.99997	peak displacement of interferometer arm	~ ± 1 am
distance	1.6 to 4.3 billion light-years	frequency at peak GW strain	160 to 199 Hz
redshift	0.10 to 0.25		
total mass	46 to 57 $M_\odot$	wavelength at peak GW strain	1510 to 1880 km
primary BH mass	25 to 40 $M_\odot$		
secondary BH mass	13 to 25 $M_\odot$	peak GW luminosity	1.8 to 3.8×10^{56} erg s^{-1}
mass ratio	0.36 to 0.94	radiated GW energy	1.3 to 2.6 $M_\odot$
remnant BH mass	44 to 54 $M_\odot$	remnant ringdown freq.	297 to 373 Hz
remnant BH spin	0.39 to 0.7	remnant damping time	2.5 to 3.2 ms
remnant size (effective radius)	123 to 150 km	consistent with general relativity?	passes all tests performed
remnant area	1.9 to 2.8 x 10^5 km^2	graviton mass combined bound	≤ 7.7 x 10^{-23} eV/c^2
effective spin parameter	-0.42 to 0.09		
effective precession spin parameter	unconstrained	evidence for dispersion of GWs	none

Parameter ranges correspond to 90% credible intervals.

Acronyms:

L1/H1=LIGO Livingston/Hanford, am=attometer=10^{-18} m, $M_\odot$=1 solar mass=2 x 10^{30} kg