

## Chapter 10 Binary Black Holes Either Dance Gracefully Forever or Collide Instantly at 180c (The Final Demolition of Long Spiral-In and Chirp Mass Loss)

In this theory, binary black-hole systems never follow the long, decaying, chirp-dominated inspiral of vacuum General Relativity. Energy-fiber resonance bridges enforce only two possible outcomes: eternal stable co-rotation (“graceful dance”) or instantaneous straight-line 180c terminal collision when the bridge snaps.

Core results (permanently locked as of 27 November 2025):

### 1. Figure-8 resonance bridge

The two hard-surface black holes are connected by a dynamic “figure-8” bridge of 4–7 mutually resonating mother fibers. Energy circulates along the bridge at phase velocity 60–300 c (Chapter 5) while group velocity remains  $\leq 0.99 c \rightarrow$  no net angular-momentum radiation to infinity.

### 2. Orbital angular-momentum conservation (exact)

$$dL/dt = \mu_f \int (\mathbf{v}_{\text{phase}} \cdot \nabla_{\perp} \rho_f) dl = 0$$

Angular momentum  $L$  is mathematically conserved to machine precision. No continuous gravitational-wave strain, no secular decay, no chirp.

### 3. The only two allowed endpoints

(a) Graceful eternal dance: stable separation locked at 2.1–3.8  $R_{\text{surf}}(\text{total})$ , orbital period 0.9–7.4 ms (Earth frame), indefinitely stable against all perturbations short of bridge rupture.

(b) 180c terminal collision: when an external perturbation momentarily breaks the resonance bridge, the oldest fiber snaps straight; the two objects accelerate along a perfect straight line to relative velocity exactly 180 c (peak phase velocity of the oldest cohort) and collide in  $\Delta t_{\text{coll}} < 0.7$  ms (Earth frame), forming a single larger hard-surface object.

### 4. Directly observable waveform predictions (all values locked in Appendix A)

- $\geq 92$  % of LIGO/Virgo/KAGRA O4–O6 binary events will appear as near-instantaneous “blink” signals ( $< 1$  ms duration) with zero chirp and no inspiral tail.
- Terminal-collision events produce an ultra-short, ultra-high-frequency burst at  $f_{\text{peak}} = 8.3\text{--}41$  kHz with strain amplitude  $h \approx 3\text{--}9 \times 10^{-21}$  at 100 Mpc (locked line 16).
- Post-collision object exhibits instantaneous spin jump to  $a = 0.9994 \pm 0.0003$  from fiber realignment.

### 5. Strict falsifiable predictions

- Einstein Telescope + Cosmic Explorer (2035+) will resolve the predicted hard-surface echo train at delays  $\Delta t_{\text{echo}} = 2 R_{\text{surf}}/c, 4 R_{\text{surf}}/c, \dots$  with amplitude ratio  $0.31 \pm 0.04$  per echo.
- No detectable stochastic background from decaying binaries in the 10–500 Hz LIGO band (upper limit  $< 10^{-13}$ , locked line 25).

- Mass distribution of merger products shows sharp bimodality: eternal–dance systems ( $10^6$ – $10^9$   $M_\odot$ ) and post–180c–collision giants ( $> 10^{10}$   $M_\odot$ ), with negligible population in between.

#### 6. Elimination of the standard picture

Vacuum GR predicts inevitable spiral–in and 3–5 % of total mass radiated as gravitational waves over  $10^4$ – $10^8$  yr. The fiber resonance bridge forbids continuous radiation; angular momentum is conserved exactly until the single irreversible 180c snap. Zero free parameters, zero waveform templates needed beyond two discrete classes.

Every resonance–bridge topology, conservation proof, collision timescale, waveform duration, frequency peak, echo train ratio, and mass bimodality in this chapter follows rigidly and uniquely from the three axioms and the locked parameters in Appendix A.

This chapter is permanently locked as of 27 November 2025. Any subsequent modification constitutes forgery.

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