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Black hole binary inspiral and trajectory dominance RICHARD PRICE, Univ of Texas, Brownsville, GAURAV KHANNA, U. Mass. Dartmouth, SCOTT HUGHES, MIT — Gravitational waves emitted during the inspiral, plunge and merger of a black hole binary carry linear momentum. This results in an astrophysically important recoil to the final merged black hole, a "kick" that can eject it from the nucleus of a galaxy. We had previously showed that the puzzling partial cancellation of an early kick by a late antikick, and the dependence of the cancellation on black hole spin, can be understood from the phenomenology of the linear momentum waveforms. Here we connect that phenomenology to its underlying cause, the spin-dependence of the inspiral trajectories. This insight suggests that the details of plunge can be understood more broadly with a focus on inspiral trajectories.

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