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Binary black hole initial data with tidal deformations and outgoing radiation NATHAN JOHNSON-MCDANIEL, Penn State, NICOLAS YUNES, Princeton, WOLFGANG TICHY, FAU, BENJAMIN OWEN, Penn State — We present initial data for the quasicircular inspiral of a nonspinning black hole binary, including tidal deformations and outgoing radiation. We construct these data by asymptotically matching two perturbed Schwarzschild metrics to a post-Newtonian (PN) metric. We carry out this matching through $O(v^4)$ (v is the binary's orbital velocity) so the data are conformally curved. The PN metric includes both near and radiation zone contributions and uses the 3.5PN results for the binary's past history. Asymptotic matching produces piecewise continuous global data; we smooth the joins using transition functions. The inclusion of tidal deformations and outgoing radiation might ameliorate the initial burst of spurious radiation observed with conformally flat data. Such an improvement might be essential for simulations to provide sufficiently accurate templates for parameter estimation with advanced gravitational wave detectors.

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