New Initial Data with Trumpet Time Slices for Highly Boosted Black Holes[1] KYLE SLINKER, CHARLES EVANS, Univ of NC - Chapel Hill, MARK HANNAM, Cardiff University — We show a new method for constructing numerical relativity initial data for moving black holes with high Lorentz factor. For a single black hole, this data is constructed through a sequence of coordinate changes applied to Schwarzschild spacetime. It therefore, by construction, analytically solves the constraint equations and contains virtually no junk gravitational radiation beyond discretization errors. The initial time slice has trumpet topology closely adapted to the 1+log gauge condition, which the moving punctures gauge conditions rapidly drive to a stationary state. Compared with Bowen-York initial data, our data contains several orders of magnitude less junk radiation and yields a smooth initialization of black hole evolutions with Lorentz factors up to 2 or more.

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