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Primordial Black Holes from First Principles (numerics) JOLYON BLOOMFIELD, ZANDER MOSS, CASEY LAM, MEGAN RUSSELL, STEPHEN FACE, ALAN GUTH, Massachusetts Institute of Technology — In order to compute accurate number densities and mass spectra for primordial black holes from an inflationary power spectrum, one needs to perform Monte Carlo integration over field configurations. This requires a method of determining whether a black hole will form, and if so, what its mass will be, for each sampled configuration. In order for such an integral to converge within any reasonable time, this requires a highly efficient process for making these determinations. We present a numerical pipeline that is capable of making reasonably accurate predictions for black holes and masses at the rate of a few seconds per sample (including the sampling process), utilizing a fully-nonlinear numerical relativity code in 1+1 dimensions.

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