

Evolution of the inhomogeneous universe: From Inflation to structure formation

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STOLAS: STOchastic LAttice Simulation of cosmic inflation

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We develop a C++ package of the STOchastic LAttice Simulation (STOLAS) of cosmic inflation. It performs the numerical lattice simulation in the application of the stochastic-deltaN formalism. STOLAS can directly compute the three-dimensional map of the observable curvature perturbation without estimating its statistical properties. In its application to two toy models of inflation, chaotic inflation and Starobinsky's linear-potential inflation, we confirm that STOLAS is well-consistent with the standard perturbation theory. Furthermore, by introducing the importance sampling technique, we have success in numerically sampling the current abundance of primordial black holes in a non-perturbative way.

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