

Arbitrary high-order semi-Lagrangian schemes for the Vlasov equation

E. Sonnendrücker

The Vlasov equation describes the evolution of charged particles in phase space. In order to avoid severe time step restrictions, the semi-Lagrangian method, which consists in solving for the characteristics of the equation and then interpolating, has become widely used, most of the time with a cubic spline interpolation. We shall present here arbitrary high order spline and Lagrange interpolation as well as trigonometric interpolation and see how these compare on some relevant test cases from plasma physics.