

Part II
Microscopic Semi-Classical Models

The fundamental evolution equations for classical charged particle flow are Newton's laws. When the number of particles is large, a statistical description is recommended, modeling the behavior of the particle ensemble by a probability density or distribution function. We derive kinetic equations describing the evolution of the distribution function in the phase space (or, more precisely, the position-wave vector space). First, we consider models without collision mechanisms, such as the Liouville and Vlasov equations. Then, we allow for scattering events leading to the Boltzmann equation.