

Transport of charged particles under strong magnetic fields and collisions

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Abstract

We focus on the asymptotic behavior of the Vlasov-Poisson system with strong external magnetic field, when the frequency of collisions is not neglected. We are looking for fluid limit models : the limit particle densities are Maxwellian equilibria, parametrized by macroscopic quantities (particle concentration). The analysis is much complex in the three dimensional setting, since in that case we need to handle extra constraints. At the limit, the concentration is advected along the electric cross field drift, magnetic gradient drift, magnetic curvature drift.