

Mathematical analysis for the transport of charged particles under strong curved magnetic field

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Abstract

We focus on the asymptotic behavior of the three dimensional Vlasov-Poisson system with strong external magnetic field. We investigate second order approximations, when taking into account the curvature of the magnetic lines. The study relies on multi-scale analysis and allows us to determine a regular reformulation for the Vlasov-Poisson equations with well prepared initial conditions, when the magnetic field becomes large.