Homogenization and Two-Scale Convergence for Partial Differential Equations

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Abstract

We introduce the homogenization theory through the two-scale convergence for the one dimensional elliptic equation first to obtain the homogenized equation. And then we study the homogenization problem of the Vlasov-Poisson system arising from plasma physics. We show that it generates memory effects. The averaged density distribution function of the solution of the homogenized equation in the real space leads to the diffusion effect. From the perturbation of homogenized equilibrium state, the Langmuir wave dispersion relation and Landau damping effect are also obtained.

References


