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Vector Transport Processes in a Magnetized Dilute Plasma A.L. GARCIA-PERCIANTE, L.S. GARCIA-COLIN, Universidad Autonoma Metropolitana, A. SANDOVAL-VILLALBAZO, Universidad Iberoamericana — In this work we present a formal derivation of transport phenomena in a dilute plasma based on the solution to the complete Boltzmann equation which, in contrast to its diffusive approximation (Fokker-Planck), allows for cross-effects and the derivation of exact transport coefficients in all directions (parallel, perpendicular and oblique to the magnetic field). It also permits, by appropriately defining thermodynamic fluxes and forces, the consistent placement of the theory within the framework of non-equilibrium thermodynamics. We show an explicit calculation of all transport coefficients including the Soret and Dufour cross-effects which are usually neglected in plasma transport theories. We here show that the latter is not only relevant but also the most important source of heat conduction for weak magnetic fields in both parallel and perpendicular directions, leading to a new effective conductivity coefficient. Other aspects of this work, as the Righi-Leduc effect, are also emphasized and progress in the visco-magnetic effects is presented.

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