Asymptotic transition from kinetic to adiabatic electrons along magnetic field lines. Numerical studys.

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Plasma dynamics is known to involve several time and space scales, fact which renders its study particularly challenging, from an analytical as well as numerical point of view. In this talk I will focus on the electron dynamics, studied on the time scale of the ion thermal motion, leading to a quasi-adiabatic response of the electrons in this regime (electron Boltzmann relation). I will present two numerical schemes for solving the electron evolution equation along the transition $\epsilon \to 0$ from the kinetic regime to the adiabatic regime, in a uniformly stable way with respect to ϵ.

This work is in collaboration with Stefan Possanner, and has been started during my stay in Munich, in spring 2018.