



Oberseminar Analysis

Donnerstag, 08.10.2015

15:15 Uhr

A 314

Es spricht

Prof. Dr.

Claude Bardos

(Paris)

About the Maxwell-Boltzmann relation in Plasmas

In this talk I report on progresses recently made in collaboration with several colleagues: with Toan Nguyen and several coworkers: Nicolas Besse, Irene Gamba, Francois Golse, Claudia Negulescu and Rémi Sentis.

Description of Plasma physic involve in general the equations for distribution of electrons $f_-(x, v, t)$ and for the distribution of ions $f_+(x, v, t)$. In presence of a strong (but given magnetic field) the coupling involves the electric potential ϕ given by:

$$-\lambda\Delta\phi = e_+ \int_{\mathbf{R}_v^d} f_+(x, v, t) dv - e_- \int_{\mathbf{R}_v^d} f_-(x, v, t) dv$$

The Maxwell Boltzmann relation refers to the approximation of the above coupling by the relation:

$$-\lambda\Delta\phi + e^{\beta\phi} = e_+ \int_{\mathbf{R}_v^d} f_+(x, v, t) dv$$

This is well known in the physic literature. However up to now no attempt of justification of this closure relation based on scaling arguments and first principles was available; In this talk I try to propose such derivation.