

Talk of Claudia Negulescu:
Fokker-Planck multi-species equations in the adiabatic
asymptotics

The main concern of the present talk is the study of the multi-scale dynamics of thermonuclear fusion plasmas via a multi-species Fokker-Planck kinetic model. One of the goals is the generalization of the standard Fokker-Planck collision operator to a multi-species one, conserving mass, total momentum and energy, as well as satisfying Boltzmann's H-theorem. Secondly, we perform on one hand a mathematical asymptotic limit, letting the electron/ion mass ratio converging towards zero, to obtain a thermodynamic equilibrium state for the electrons (adiabatic regime), whereas the ions are kept kinetic. On the other hand, we develop a first numerical scheme, based on a Hermite spectral method, and perform numerical simulations to investigate in more details this asymptotic limit.