# Abstract

Magnetohydrodynamics (MHD) is a general theory suitable to describe electrically charged fluids. It is used in very different area from astrophysics, space weather or the study of fusion plasmas. Depending on the area, several approximations of the full MHD equations have been proposed. In the field of fusion plasmas, these approximation are known as reduced MHD models and are extensively used to study MHD instabilities in tokamaks.

In this talk, we will show that the derivation of reduced MHD can be formulated as a special instance of the theory of singular limit of hyperbolic system of PDEs with large operator. This formulation allows to use the general results of this theory and to prove rigorously that reduced MHD models are valid approximations of the full MHD equations. In particular, we will prove that the solutions of the full MHD system converge to the solutions of an appropriate reduced model.