



YONSEI Math-CSE Colloquium

Mathematical Analysis of Solutions to the MHD

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In this talk, we consider the dynamics of the electrically conducting fluids-magnetohydrodynamics(MHD)- and introduce the various models for conducting fluids.

MHD can be described by the coupled system of Navier-Stokes equations and Maxwell equations with Ohm's law, usually called Navier-Stokes-Maxwell system. We briefly review some results of the existence of solutions to the Navier-Stokes-Maxwell system. If we neglect the current displacement, then the Navier-Stokes-Maxwell system will be reduced to the usual MHD equations. We also briefly review some results of the existence of solutions to the usual MHD. If we consider the generalized Ohm's law instead of Ohm's law for the MHD equations, then we have the Hall-MHD equations, which play an important role for the magnetic reconnection. We also present the brief review of the related mathematical analysis for the solutions to the Hall-MHD.

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