L^1 solutions of the two-dimensional viscous MHD vorticity-current equations

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Abstract

We consider the two dimensional magneto-hydrodynamic (MHD) equations describing the evolution of an incompressible electrically conducting fluid, with velocity $\boldsymbol{u} = (u_1, u_2)$, moving through a magnetic vector field $\boldsymbol{B} = (b_1, b_2)$. The interaction between the fluid velocity and the magnetic field is described by the coupling between the Navier-Stokes equations and the Maxwell's equations. The fluid vorticity ω and the magnetic current density j are defined, respectively, by $\omega = \partial_1 u_2 - \partial_2 u_1$ and $j = \partial_1 b_2 - \partial_2 b_1$. In this talk we present results about the well-posedness of the viscous MHD equations in the whole space $\mathbb{R}^2$, with initial fluid vorticity and initial magnetic current in $L^1(\mathbb{R}^2)$.

References

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