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WUHAN UNIVERSITY ACADEMIC NEWS

报告题目: On the free boundary problem of incompressible ideal MHD

报告人: 郝成春 研究员 (中国科学院数学与系统科学研究院)

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报告摘要: In this talk, I will review some results of free boundary problem of incompressible ideal MHD in a bounded domain based on the joint works with Prof. T. Luo. We obtained the a priori estimates for the nonlinear system under a Taylor-sign type condition. We gave the ill-posedness of the system in 2D disk domain if it did not satisfy this Taylor-sign type condition on the free boundary. We also studied the well-posedness for the linearized system. We expressed the magnetic field in terms of the velocity field and the deformation tensors in the Lagrangian coordinates, and substituted the magnetic field into the momentum equation to get an equation of the velocity in which the initial magnetic field serves only as a parameter. Then, we linearized this equation with respect to the position vector field whose time derivative was the velocity, and obtained the local-in-time well-posedness of the solution by using energy estimates of the tangential derivatives and the curl with the help of Lie derivatives and the smooth-out approximation.

