

Special Program in Applied Mathematics and Applied Mechanics

Magnetoconvection in Liquid Metals

Prof. Yadagiri Rameshwar

2018 - 11 - 29 (Thu.)

14:00 - 16:00

103, Mathematics Research Center Building (ori. New Math. Bldg.)

Finite amplitude convection of an electrically conducting fluid in a plane layer is studied with stress free boundary conditions. Weakly nonlinear analysis is studied in the supercritical region of stationary convection. By deriving finite amplitudes at the eighth order $O(\epsilon^8)$, the heat transfer rate, heatlines are computed near the onset as well as for the higher values of Rayleigh number and small thermal Prandtl number. The study of this model is related to Chandrasekhar [1], Aurnou and Olson experiments [2].

[1] S.Chandrasekhar, (1961), Hydrodynamic and Hydromagnetic Stability, Oxford, Clarendon Press.

[2] J.M. Aurnou and P.L. Olson, (2001), Experiments on Rayleigh-Benard Convection, Magnetoconvection and Rotating Magnetoconvection in liquid gallium, Vol. 430, JFM, PP. 283-307.



Center for Advanced Study in Theoretical Sciences, NTU