

# Magneto Thermal Convection in a Compressible Couple-Stress Fluid

Mahinder Singh<sup>a</sup> and Pardeep Kumar<sup>b</sup>

<sup>a</sup> Lovely School of Science, Department of Mathematics, Lovely Professional University,  
Phagwara (Pb), India

<sup>b</sup> Department of Mathematics, ICDEOL, H. P. University, Shimla (HP), India

Reprint requests to M. S.; E-mail: mahinder\_singh91@rediffmail.in or drpardeep@sancharnet.in

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The problem of thermal instability of compressible, electrically conducting couple-stress fluids in the presence of a uniform magnetic field is considered. Following the linearized stability theory and normal mode analysis, the dispersion relation is obtained. For stationary convection, the compressibility, couple-stress, and magnetic field postpone the onset of convection. Graphs have been plotted by giving numerical values of the parameters to depict the stability characteristics. The principle of exchange of stabilities is found to be satisfied. The magnetic field introduces oscillatory modes in the system that were non-existent in its absence. The case of overstability is also studied wherein a sufficient condition for the non-existence of overstability is obtained.

*Key words:* Thermal Instability; Compressible Couple-Stress Fluid; Uniform Magnetic Field; Linearized Theory; Normal Mode Analysis.