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# HALL CURRENT EFFECT ON DOUBLE DIFFUSIVE CONVECTION OF COUPLE-STRESS FERROMAGNETIC FLUID IN THE PRESENCE OF VARYING GRAVITATIONAL FIELD AND HORIZONTAL MAGNETIC FIELD THROUGH A POROUS MEDIA

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**Abstract:** The effect of hall current on a couple-stress ferromagnetic fluid heated and soluted from below in the presence of varying gravitational field and horizontal magnetic field through a porous media is considered. A linearized hypothesis and normal mode procedure are utilized to get dispersion relation. For the case of stationary convection, stable solute gradient has a stabilizing effect on the system. Medium permeability and couple-stress both have stabilizing and destabilizing effects under specific conditions. Additionally, magnetic field and hall current have both stabilizing as well as a destabilizing effect on the system under some conditions. It is likewise discovered that in the absence of stable solute gradient, magnetization has a stabilizing effect on the system. Oscillatory modes are introduced in the system in the presence of magnetic field (hence hall current) and stable solute gradient, though in their nonappearance, the principle of exchange of stabilities is satisfied in the system. Graphs also have been plotted by giving some numerical values to the parameters.

**Keywords and Phrases:** Double diffusive convection, ferromagnetic fluid, couple-stress fluid, hall current, porous media.

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