Magneto-Solutal Convection in Newtonian Fluid Layer with Modulated Gravity

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Abstract : In the present study, the effect of gravity modulation on the onset of convection in viscous fluid layer under the influence of induced magnetic field, salted from above on the boundaries, has been investigated. Linear and nonlinear stability analysis has been performed. A linear stability analysis is performed to show that the gravity modulation can significantly affect the stability limits of the system. A method based on small amplitude of the modulation is used to compute the critical value of Rayleigh number and wave number. The effect of Smith number, salute Rayleigh number and magnetic Prandtl number on the stability of the system is investigated.