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Notice for the PhD Viva Voce Examination

Ms Keerthana S (Registration Number: 2071509), PhD Scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore Central Campus will defend her PhD thesis at the public viva-voce examination on Wednesday, 09 April 2025 at 1.00 pm in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru - 560029, Karnataka, India.

Title of the Thesis	:	**Single, Double, and Triple Diffusive Convection in a Bi-Viscous Bingham Fluid Layer**
Discipline	:	**Mathematics**
External Examiner - I	:	**Dr Satyanarayana Badeti** Associate Professor School of Advanced Science Vellore Institute of Technology Andhra Pradesh University Amaravathi – 500072, Telangana
External Examiner - II	:	**Dr Siddalinga Prasad M** Associate Professor Department of Mathematics Siddaganga Institute of Technology Tumkur, Karnataka - 572103
Supervisor	:	**Dr Smita Saklesh Nagouda** Associate Professor Department of Mathematics School of Sciences CHRIST (Deemed to be University) Bengaluru-560029, Karnataka
Co-Supervisor	:	**Dr Sameena Tarannum** Assistant Professor (Former) Department of Professional Studies School of Commerce, Finance and Accountancy CHRIST (Deemed to be University) Bengaluru-560029, Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar (Academics)

Place: Bengaluru
Date: 02 April 2025

ABSTRACT

In this thesis, we study single, double, and triple diffusive convection in a bi-viscous Bingham fluid between two stress-free, isothermal horizontal plates under various constraints. We examine the effects of constraints such as gravity and temperature modulations on diffusive convection in a bi-viscous Bingham fluid layer. Additionally, we explore the impacts of different combinations of aqueous-salt-solutions and cross-diffusion in the fluid layer. Linear and nonlinear analyses for the single, double, and triple diffusive convection are performed to investigate in a bi-viscous Bingham fluid layer subjected to various constraints. Therefore, to comprehend the effect of various parameters for small and large yield-stress values on the onset of convection and to assess how the heat and mass transfers are enhanced is the another important goal of this study.

Keywords: *Rayleigh-Bénard Convection, Triple Diffusive Convection, Bi-viscous Bingham Fluid, Ginzburg-Landau Model, Gravity Modulation, Temperature Modulation, Aqueous-Salt-Solutions, Cross-Diffusion Effects, Sinusoidal and Non-sinusoidal Waveforms, Nusselt Number and Sherwood Numbers.*

Publications:

1. **Keerthana. S**, P. G. Siddheshwar, Sameena Tarannum, and Ruwaidiah Idris, _Rayleigh-Bénard Convection in a Bi-viscous Bingham Fluid with Weak Vertical Harmonic Oscillations: Linear and Non-linear Analyses,_ International Journal of Applied and Computational Mathematics, vol. 9, pp. 1-15, 2023. DOI: https://www.doi.org/10.1007/s40819-023-01495-6
2. **Keerthana. S**, P. G. Siddheshwar, and Sameena Tarannum, _Analytical Study of Triple Diffusive Convection in a Bi-viscous Bingham Fluid Layer using Ginzburg-Landau Model, Numerical Heat Transfer, , Part A: Applications, vol. 85, no. 18, pp. 1-26, 2024. DOI: https://www.doi.org/10.1080/10407782.2024.2368752
3. **Keerthana. S**, P. G. Siddheshwar, and Sameena Tarannum, _Weakly Non-linear Stability Analysis of Triple-Diffusive Convection in a Bi-viscous Bingham Fluid Layer with Cross-Diffusion Effects, International Journal of Applied and Computational Mathematics, vol. 10, pp. 1-32, 2024. DOI: https://www.doi.org/10.1007/s40819-024-01774-w