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Notice for the PhD Viva Voce Examination

Ms Ansa Mathew (Registration Number: 1881505), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bengaluru will defend her PhD thesis at the public viva-voce examination on Wednesday, 14 December 2022 at 10.00 am in Room No. 911, 9th Floor, Central Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**Effect of Various Double-Frequency Modulations on Rayleigh-Bénard Convection**
Discipline	:	**Mathematics**
External Examiner (Outside Karnataka)	:	**Dr Sathyananda Panda** Professor Department of Mathematics NIT Calicut, Kozhikode Kerala - 673601
External Examiner (Within Karnataka)	:	**Dr G Jayalatha** Associate Professor Department of Mathematics R V College of Engineering Bengaluru - 560059 Karnataka
Supervisor	:	**Dr Pranesh S** Professor Department of Mathematics School of Sciences 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.

Registrar

Place: Bengaluru
Date: 8 December 2022

ABSTRACT

Rayleigh-Bénard convection in Newtonian fluid under different types of modulations are studied in this thesis by replacing the single frequency modulations with two frequency modulations with different amplitude and frequency. Linear and non-linear analysis of Rayleigh-Bénard convection is considered under two-frequency gravity, rotation, temperature, magnetic field and internal heat generation modulation. The sixteen combinations of sinusoidal (trigonometric sine) and non-sinusoidal (square, triangular, sawtooth) wave forms of different modulations are considered to study the impact of modulations on the onset of convection and heat transport.

The expressions for unmodulated Rayleigh number and correction Rayleigh number in the linear case are obtained from linearized Lorentz model using Venezian approach. To study the impact of different types of modulations and wave forms on the heat transport, the expression for the Nusselt number is obtained by solving the non-linear Lorentz model numerically. From the study it is found that the two-frequency modulations make the system more stable compare to no-modulation and single-frequency modulations. The mixing angle of the two frequency plays major role in deciding the stability of the system. The results pertaining to no-modulation and single frequency are obtained as the limiting cases.

Keywords: *Two-frequency, Sinusoidal, Non-sinusoidal, Lorenz model, Rayleigh Number, Rotational Modulation, Gravity Modulation, Internal Heat Modulation, Temperature Modulation, Magnetic Field Modulation*