

# **Individual Effects of Four Types of Time Dependent Boundary Temperature on Rayleigh-Bénard Convection in Maxwell Fluid**

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Abstract:

The effects of four types of (sinusoidal/non-sinusoidal) time dependent boundary temperature on Rayleigh-Bénard convection in a Maxwell fluid is examined by performing linear analysis. The influence of sine, square, triangular and sawtooth wave-type of time-dependent boundary temperature on the convective onset is studied for three cases of modulation, namely, (i) in-phase, (ii) lower-wall and (iii) out-of-phase. In the case of linear analysis, the expression for the Rayleigh number and its correction are obtained by following the Venezian approach. The study reveals that out-of-phase time-dependent boundary temperature stabilizes the system most compared to in-phase modulation. This result is valid for all types of sinusoidal/non-sinusoidal waveforms considered in the study.