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Effect of a vibrating side wall on convective heat transfer in an enclosure with varying bottom wall temperature distribution SAEID RAHEIMPOUR ANGENEH, MURAT K. AKTAS, TOBB ETU — This study mainly focuses on the thermal convection in a rectangular enclosure in the presence of streaming motion while temperature profile of bottom wall is sinusoidal. The effect of wall displacement amplitude and the bottom wall temperature profile on convective heat transfer in the enclosure are determined with the help of a parametric study. By vibrating side wall of the enclosure, oscillating flow is actuated. The top wall of the enclosure is kept at initial temperature and isothermal while the side walls are adiabatic. In order to predict the oscillatory and time averaged mean flow fields, fully compressible form of the Navier – Stokes equations are considered. Simulation of the convective transport in the enclosure is obtained by a control-volume method based, explicit computational scheme is used. The aim of this study is to provide interpretation of the flow and thermal transport physics. The influence of nonzero mean vibrational flow on the thermal convection from a surface with sinusoidal temperature distribution has never been investigated before. Conclusions may lead up to design of new heat removal applications.

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