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**Flow past a moderately heated horizontal cylinder at low Reynolds number** A. SAMEEN, S. AJITH KUMAR, Aerospace engg, IITMadras, Chennai, India, S. ANIL LAL, Department of Mechanical Engineering, ollege of Engineering Trivandrum, India — In the present work, the influence of heat on vortex shedding and the wake structure in a flow cylinder is analyzed. Flow past a heated two dimensional cylinder in the laminar regime is investigated in the range of Reynolds numbers 25 to 100 under varying buoyancy conditions, $0 \leq Ri \leq 1.0$ (where $Ri$ is the Richardson number, indicates the relative dominance of the inertial and buoyant effects). A hybrid FEM-FVM method is used to solve Navier-Stokes and energy equations. The vortex shedding frequency defined non-dimensionally as Strouhal number is observed to be increasing with heating. Vortex shedding behind heated cylinder exhibit asymmetry in wake region due to stable and unstable density stratification below and above the cylinder respectively. A negative lift is generated due to heating, in an otherwise symmetric zero time-averaged lift configuration, due to skewness in vortex shedding towards the direction of buoyancy. We also note that the heating brings down the drag slightly for the cases considered here. We also note here that at large Ri, the drag coefficient ($C_D$) decrease by $\sim$ 30% at $Re = 25$, percentage of decrease being less pronounced at higher Re (=100).

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