

Unconfined Laminar Nanofluid Flow and Heat Transfer around a Square Cylinder with an Angle of Incidence

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Abstract : A finite-volume method simulation is used to investigate two dimensional unsteady flow of nanofluids and heat transfer characteristics past a square cylinder inclined with respect to the main flow in the laminar regime. The computations are carried out of nanoparticle volume fractions varying from $0 \leq \phi \leq 5\%$ for an inclination angle in the range $0^\circ \leq \delta \leq 45^\circ$ at a Reynolds number of 100. The variation of stream line and isotherm patterns are presented for the above range of conditions. Also, it is noticed that the addition of nanoparticles enhances the heat transfer. Hence, the local Nusselt number is found to increase with increasing value of the concentration of nanoparticles for the fixed value of the inclination angle.

Keywords : copper nanoparticles, heat transfer, square cylinder, inclination angle

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