

عنوان مقاله:

Mathematical model of velocity and thermal boundary layer over a flat plate

محل انتشار:

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خلاصه مقاله:

This paper presents a complete mathematical model for two dimensional, steady state and Newtonian incompressible fluid flow over a flat plate with a constant wall temperature and free stream velocity. The governing equations including the conservation equations of mass, momentum and energy are coupled together and solved simultaneously to consider the temperature dependent physical properties of fluid. Simulation results are used to investigate the applicable range of Blasius solution which was developed for laminar flow. Analyses of numerical solution are presented for Prandtl number of 1. Mathematical model is solved based on finite element method using COMSOL software. Simulation results show that there are Reynolds number limitation for using Blasius solution in .which assumes constant thermo physical property for fluid and neglect the pressure gradient

کلمات کلیدی:

Boundary layer, Heat transfer, fluid flow, Blasius solution, Mathematical model

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