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عنوان مقاله:

Steady State Analysis of Natural Convective Flow over a Moving Vertical Cylinder in the Presence of Porous Medium

محل انتشار:

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خلاصه مقاله:

A numerical study is carried out for a free convection flow past a continuously moving semi-infinite vertical cylinder in the presence of porous medium. The governing boundary layer equations are converted into a non-dimensional form and then they are solved by an efficient, accurate and unconditionally stable implicit finite difference scheme of Crank-Nicolson method. Stability and convergence of the finite difference scheme are established. The velocity, temperature and concentration profiles have been presented for various parameters such as Prandtl number, Schmidt number, thermal Grashof number, mass Grashof number and permeability of the porous medium. The local as well as average skin-friction, Nusselt number and Sherwood number are also shown graphically. It is observed that the increase in the permeability parameter leads to increase in velocity profile, local as well as average shear stress, Nusselt number and Sherwood number but leads to decrease in temperature and concentration profiles. The results of temperature and .concentration profiles are compared with available result in literature and are found to be in good agreement

کلمات کلیدی:

Vertical cylinder, Natural convection, Heat and mass transfer, Porous medium, Finite difference

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