Rotating boundary layer flow due to a permeable exponentially shrinking sheet in nanofluid

ABSTRACT

In this study, the effect of the suction on the boundary layer flow and heat transfer characteristics over an exponentially shrinking surface in a rotating nanofluid is contemplated for three types of nanoparticles namely, copper Cu, titania TiO2 and alumina Al2O3. Similarity transformations have been applied to transform the partial differential equations into a system of ordinary differential equations, which are then solved numerically using a shooting method in Maple software. The effects of the rotation Ý, suctions and nanoparticle volume fraction ű parameters on the velocity field, temperature distribution, local skin friction co-efficients and local Nusselt number are taken into account. Results obtain in this study are graphically presented and further discussion have been discussed in detail. The dual solutions are found to exist for a certain values of the governing parameters. It is revealed from the study that the presence of the rotation would increase the skin friction coefficients and heat transfer rate at the surface.

Keyword: Exponentially shrinking sheet; Nanofluid; Rotating flow; Suction