MHD and slip effect in micropolar hybrid nanofluid and heat transfer over a stretching sheet with thermal radiation and non-uniform heat source/sink

ABSTRACT

In the presence of slips, non-uniform heat source/sink, thermal radiation and magnetohydrodynamic (MHD), micropolar hybrid nanofluid and heat transfer over a stretching sheet has been studied. The problem is modelled as a mathematical formulation that involves a system of the partial differential equation. The similarity approach is adopted, and self-similar ordinary differential equations are obtained and then those are solved numerically using the shooting method. The flow field is affected by the presence of physical parameters such as micropolar parameter, magnetic field parameter, suction parameter and slip parameter whereas the temperature field is affected by thermal radiation parameter, space-dependent parameter, temperature-dependent internal heat generation/absorption parameter, Prantl number and Biot number. The skin friction coefficient, couple stress and local Nusselt number are tabulated and analysed. The effects of the governing parameters on the velocity profiles, angular velocity profiles and temperature profiles are illustrated graphically. The results of velocity profiles, angular velocity profiles and temperature profiles are also obtained for several values of each parameters involved.