Stability analysis of MHD flow and heat transfer passing a permeable exponentially shrinking sheet with partial slip and thermal radiation

ABSTRACT

This paper has investigated the steady magnetohydrodynamic (MHD) flow and heat transfer induced by an exponentially shrinking sheet with partial slip, thermal radiation and suction. Similarity variables are introduced to transform the governing equations into non-linear ordinary differential equations.Then,thebvp4c solver in Matlab software is utilized to solve the transformed ordinary differential equations.The effects of magnetic parameter and mass suction parameter are analyzed and presented. From the results, we notice that first and second solutions exist in certain range of suction parameter. Hence, we continue further in performing a stability analysis. We found the first solution was more stable and the skin friction coefficient increased when suction increased.