Effect of suction/injection on stagnation point flow of hybrid nanofluid over an exponentially shrinking sheet with stability analysis

ABSTRACT

This research aims to investigate the effect of suction/injection on the stagnation point flow over an exponentially shrinking sheet in a hybrid nanofluid. It is worth to mention that hybrid nanofluids are formed by adding the mixture of Ag nanoparticles into a CuO/water nanofluid. The governing boundary layer equations are transformed into an ordinary differential equation using a similarity variable. The features of the flow and heat transfer characteristic for various values of suction/injection parameter, nanoparticle volume fraction parameter and shrinking parameter are presented graphically and discussed. The results acquired are in good agreement with previously published results. Non-unique (more than one) solutions are visible for a certain range of shrinking parameter. Hence, a stability analysis is performed to identify the stability of solutions obtained. Therefore, it is confirmed that the first solution is stable whereas the second solution is unstable. It is revealed that the heat transfer rate of hybrid nanofluid is greater compared to regular nanofluid.