

Hybrid nanofluid slip flow over an exponentially stretching/shrinking permeable sheet with heat generation

ABSTRACT

An investigation has been done on the hybrid nanofluid slip flow in the existence of heat generation over an exponentially stretching/shrinking permeable sheet. Hybridization of alumina and copper with water as the base fluid is considered. The mathematical model is simplified through the similarity transformation. A numerical solver named bvp4c in Matlab software is utilized to facilitate the problem-solving process and dual solutions are attained. The influences of several pertinent parameters on the main physical quantities of interest and the profiles are scrutinized and presented in the form of graphs. Through the stability analysis, only the first solution is considered as the physical solution. As such, the findings conclude that the upsurges of volume fraction on the copper nanoparticle could enhance the skin friction coefficient and the local Nusselt number.

Keyword: Stretching/shrinking; Dual solutions; Hybrid nanofluid; Slip; Heat generation; Stability analysis