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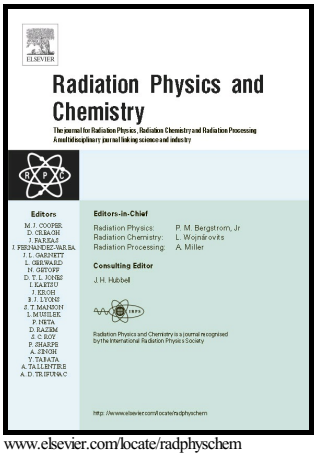

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Flow of magneto Williamson nanoliquid towards stretching sheet with variable thickness and double stratification

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Abstract: Double stratification in stagnation point flow of magneto Williamson nanoliquid towards nonlinear stretching sheet of variable thickness is explored. Flow is stretched in non-linear way since the sheet is assumed not flat. Aspects of viscous dissipation and radiation are accounted. First order chemical reaction is also present. Proper transformations lead to dimensionless the problems. Resultant problems is analytically solved via homotopic technique. Convergent solutions are obtained. Graphs and table are arranged to manifest the behavior of various influential variables. Our analysis pointed out that stratification variables diminishes the temperature and concentration. Moreover skin friction is decayed for larger magnetic parameter. Finally, conclusion of current investigations are listed in the last section.

Keywords: Williamson nanofluid; Thermal radiation; Double stratification; Viscous dissipation; Chemical reaction.

1 Introduction

Fluids are often used as heat transfer carriers in the heat transfer equipment. Heat transport fluids have extraordinary significance in innumerable industries like electronic industries, automotive industry and many others. However the traditional liquids (ethylene glycol, oil, water) are limited heat conducting and generally not accomplish the heat transfer necessity of current industrial demands. Therefore this poor conductivity can be exceeded significantly with the utilization of tiny nanoparticles (of size smaller then $100nm$) in base liquids to form nanomaterials. The nanoparticles have accomplished great consequences in many engineering and biological procedure such as medicine, solar cells, laser cutting and plasma, electronics,

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