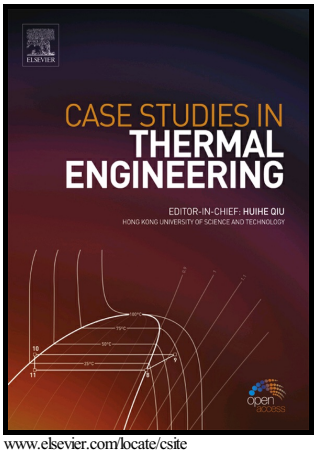

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Carreau fluid flow in a thermally stratified medium with heat generation/absorption effects

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Abstract
In this article theoretical attempt is carried to inspect the flow field characteristics of Carreau fluid model. The fluid flow is achieved by stretching cylindrical surface with no slip condition that is the relative velocity of Carreau fluid particles and cylindrical surface is zero. The role of both temperature stratification and heat generation/absorption are considered with the source of energy equation. The physical illustration of flow model with both temperature stratification and heat generation/absorption effects is translated in terms of partial differential equations through fundamental laws, namely law of conservation of mass, momentum and energy. The obtained partial differential equations are non-linear in nature and it seems difficult to solve them analytically. Therefore the boundary layer approximation is utilized to retain the active parts of flow narrating differential equations. Then to step down the partial differential equations in terms of ordinary differential equations a set of transformations is introduced. The reduced system is solved by shooting method and self-coded algorithm is executed in this regard. The note down observations are offered with the aid of graphs and tables. **It is noticed that the Carreau fluid temperature shows decline nature towards the positive values of thermal stratification parameter and heat absorption parameter but it reflects opposite trend for the case of heat generation parameter.**

Keywords: Carreau fluid model; Thermal stratification; Heat generation/absorption effects.

Nomenclature

(u, v)	Dimensionless velocity components
ρ	**Fluid density**
ν^*	**Kinematic viscosity**
α	**Thermal diffusivity**