MHD radiative flow of Casson-Williamson fluid over a stretching surface through porous media with the influence of heat source and chemical reaction.

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1. INTRODUCTION & OBJECTIVE

In the present investigation, a steady two-dimensional flow of Casson Williamson fluid over a stretching surface through porous media is influenced by joule heating, heat source, radiation, and chemical reaction. Magnetic and electric field effects are also considered. The governing equations of the physical model are modelled by nonlinear partial differential equations. The corresponding equations are reduced to a set of non-linear ordinary differential equations using suitable transformations. The Keller Box technique is used to solve the system of ordinary differential equations. Graphical representations of several parameters are constructed to analyse the impact of parameters. The local parameters skin friction coefficient, Nusselt number, and Sherwood numbers are calculated. The present results are compared with previous literature by calculating the skin friction coefficient for various values of the Casson parameter and are fairly in agreement with existing literature.

2. RESULTS & HIGHLIGHTS OF IMPORTANT POINTS

The influence of several parameters are analyzed by constructing velocity, temperature, concentration profiles using MATLAB.

- Velocity profiles shows decreasing tendency for progressive values of Casson parameter, Weissenberg number, porosity parameter, Magnetic parameter.
- Temperature profiles exhibit increasing tendency for progressive values of Casson parameter, Weissenberg number, porosity parameter, Eckert number, Joule heating parameter.
- Skin friction value increases for porosity parameter and decreases for enhanced observations of slip parameter, Casson parameter, Weissenberg number.

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