

# Computational Modelling of Prandtl-Nanofluid flow using Exponentially Vertical Surface in terms of Chemical Reaction

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May 8, 2023

## Abstract

Current study examined the magnetohydrodynamic (MHD) Prandtl nanofluid of a thermal double-diffusive flow through an exponentially vertical surface in association with heat generation, and thermophoresis effect. The novelty of this study is due to the analysis of Prandtl nanofluid model with Soret mechanism and chemically responding fluids. The fluid flow phenomenon is characterized by nonlinear coupled differential equations involving two or more independent variables. A suitable numerical technique is used to handle the set of governing equations along with a stability and convergence analysis. According to recent study, the fluid velocity increases since all the parameters are set to higher levels. For the various parametric values, isotherms and streamlines have been explored. This suggested model is beneficial since it can significantly advance the domains of thermal and industrial engineering. For instance, thermal radiation is crucial in designing sophisticated energy-transformed systems that operate at high temperatures. On the other hand, the phenomenon of Soret is useful in separating isotopes in chemical engineering. These studies have several applications in the manufacturing and biomedical fields, petrochemical industries, automobiles, medical sciences, and various production processes in industries.

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