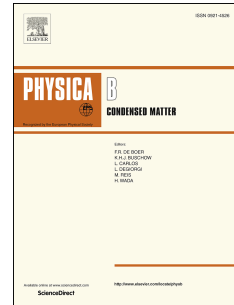


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# Modeling and analyzing flow of third grade nanofluid due to rotating stretchable disk with chemical reaction and heat source

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## Abstract

This article addresses flow of third grade nanofluid due to stretchable rotating disk. Mass and heat transports are analyzed through thermophoresis and Brownian movement effects. Further the effects of heat generation and chemical reaction are also accounted. The obtained ODE's are tackled computationally by means of homotopy analysis method. Graphical outcomes are analyzed for the effects of different variables. The obtained results show that velocity reduces through Reynolds number and material parameters. Temperature and concentration increase with Brownian motion and these decrease by Reynolds number.

**Keywords:** Third grade nanofluid; Brownian movement; Thermophoresis; Rotating stretchable disk; Heat generation; Chemical reaction.

## 1 Introduction

Nanofluids are dilute suspension of nano-scale particles in base liquids. From previous data, we concluded that the thermophysical properties (i.e thermal conductivity, viscosity, thermal diffusivity and convective heat transfer) of nanofluids are higher than base fluids like water or oil etc [1 – 2]. There are various applications of nanofluids in, heat exchanger, centrifugal and axial blades compressor, microelectronic boards circuit, gas turbines blades, computer processor, fuel cells, hybrid-powered engines, refrigerators, air-conditioners and many biological application (i.e nanodrug delivery, cancer therapeutics, cryopreservation, nanocryosurgery, sensing and imaging). Buongiorno

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