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# A STUDY OF APPLICATION OF EXPONENTIAL SPACE AND THERMAL DEPENDENT HEAT SOURCE ON MHD BOUNDARY LAYER NANOFLUID FLOW WITH ZERO MASS FLUX AT THE SURFACE OF THIN NEEDLE

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## ABSTRACT

The nanotechnology has engrossed interest of plentiful researchers for its many applications in industrial and mechanical engineering applications. Advancement of the heat transport rate is indispensable in thermal and mechanical systems. A variety of working fluids like ethylene, kerosene oil, water and glycols, etc., for viscous and non-Newtonian fluids have poor thermal performance due to their minimum thermal conductivity. Hence, improving the thermal conductivity of such fluids is the main theme of engineers. One of the finest solutions for this issue is given by Choi by introducing the term nanofluid. The nanofluids can be defined as fluids in which nanoparticles of 1–100 nm sizes are submerged in working base fluids. The inclusion of solid nanoparticles made up of metal and metal oxides to working fluid improves the functioning fluid's properties such as the thermal conductivity and specific heat. Numerous engineers and researchers implemented nanoliquids in the thermodynamics research with the help of several nanofluid models. In this chapter, the revised model of nanofluid which is done by Kuznetsov and Nield is used. Their nanofluid model revisited on the natural convective boundary layer dynamics of a nanofluid over a vertical plate by including the effects of Brownian motion and thermophoresis.