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EFFECT OF MAGNETIC FIELD ON BOUNDARY LAYER FLOW OF NANOFLUID USING THE METHOD OF DIRECTLY DEFINING INVERSE MAPPING

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Magnetic nanofluid constitutes a particular class of nanofluids that exhibit both magnetic and fluid properties. Most researchers have used this magneto nanofluid concept to investigate the thermodiffusion effect on boundary layer flow due to its extensive industrial applications. Most of the studies on the thermodiffusion effect on magneto nanofluid were based on linear stretching of the sheet. However, in reality, stretching is not necessarily linear. Therefore, researchers began to investigate the nonlinearity of the stretching sheet in the boundary layer flow of nanofluid. One of such is the thermodiffusion effect on the boundary layer flow of nanofluids over a nonlinear stretching sheet. Nevertheless, this study was conducted in the absence of a magnetic field. In this study, we hope to extend that earlier study in the presence of a magnetic field and solve the problem analytically. In that case, the Method of Directly Defining inverse Mapping, which is the most recent analytical technique we can use to find approximate solutions within the first few terms, is employed. The analytical results of this study are compared with numerical solutions and found to be in good agreement. Also, the variation of the velocity profile and the skin friction coefficient is examined with different values of magnetic field parameters, and thereby concluded that the velocity decreases with increases in the magnetic field parameter.

Keywords: Magneto nanofluid, Method of Directly Defining inverse Mapping, Thermodiffusion effect