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On boundary layer nano-ferroliquid flow under the influence of low oscillating stretchable rotating disk

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Abstract: A new model is here proposed to investigate the effects of nano-Ferroliquid under the influence of low oscillating over stretchable rotating disk. The basic governing equations are formulated under the effects of magnetic field. The resulting system of partial differential equations is first reduced in non-dimensional form by using proper transformations and then reduced coupled system of differential equations is solved analytically by means of homotopy analysis method (HAM). The physical interpretation of velocity and temperature towards different emerging parameters such as particle concentration and effective magnetization parameter are discussed graphically. The physical parameters such as shear stress at wall, heat transfer rate through wall, boundary layer thickness and volume flow rate in axial direction are also presented in tabular form. Finally a comparison with the existing literature is made as a limiting case of the reported problem and found in good agreement.

Keywords: Ferroliquid, magnetic field, low oscillation, rotating disk, HAM

1. Introduction

The magnetic field can serve as an effective intends to control magnetic liquid suspension of counterfeit magnetic particles of ferromagnetic materials. Suspensions of these materials in a carrier liquid explored the prospective for a new research field called ferrohydrodynamics

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