EFFECT OF SUCTION ON ENTROPY GENERATION OVER STRETCHING ROTATING DISK IN MHD STAGNATION FLOW

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ABSTRACT

The main concern of the present article is to study the second law analysis of an electrically conducting fluid past a porous stretching rotating disk in the presence of MHD stagnation flow, numerically via forth-order Runge-Kutta method and shooting technique. The von Karman transformations are employed to transform the governing equations into system of nonlinear ordinary differential equations. Entropy generation equation is derived as a function of velocity and temperature gradients and nondimensionalized using geometrical and physical flow field-dependent parameters. The velocity profiles in radial, tangential and axial directions, temperature distribution, and averaged entropy generation number are obtained. A very good agreement can be observed between some of the obtain results of the current study and the results of the previously published data. The effects of physical flow parameters such as magnetic interaction parameter, suction parameter, stretching parameter, Prandtl number, Reynolds number, and Brinkman number on the all fluid velocity, temperature distribution, and averaged entropy generation number are checked and discussed and the path for minimizing the entropy is also proposed.