

Effect of Thermal Radiation and Chemical Reaction on MHD Flow of Blood in Stretching Permeable Vessel

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Abstract : In this paper, a theoretical analysis of blood flow in the presence of thermal radiation and chemical reaction under the influence of time dependent magnetic field intensity has been studied. The unsteady non linear partial differential equations of blood flow considers time dependent stretching velocity, the energy equation also accounts time dependent temperature of vessel wall, and concentration equation includes time dependent blood concentration. The governing non linear partial differential equations of motion, energy, and concentration are converted into ordinary differential equations using similarity transformations solved numerically by applying ode45. MATLAB code is used to analyze theoretical facts. The effect of physical parameters viz., permeability parameter, unsteadiness parameter, Prandtl number, Hartmann number, thermal radiation parameter, chemical reaction parameter, and Schmidt number on flow variables viz., velocity of blood flow in the vessel, temperature and concentration of blood has been analyzed and discussed graphically. From the simulation study, the following important results are obtained: velocity of blood flow increases with both increment of permeability and unsteadiness parameter. Temperature of the blood increases in vessel wall as Prandtl number and Hartmann number increases. Concentration of the blood decreases as time dependent chemical reaction parameter and Schmidt number increases.

Keywords : stretching velocity, similarity transformations, time dependent magnetic field intensity, thermal radiation, chemical reaction

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