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MAGNETIC FIELD AND THERMAL RADIATION EFFECTS ON STEADY HYDROMAGNETIC COUETTE FLOW THROUGH A POROUS CHANNEL

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Abstract. This paper investigates effects of thermal radiation and magnetic field on hydromagnetic Couette flow of a highly viscous fluid with temperature-dependent viscosity and thermal conductivity at constant pressure through a porous channel. The influence of the channel permeability is also assessed. The relevant governing partial differential equations have been transformed to non-linear coupled ordinary differential equations by virtue of the steady nature of the flow and are solved numerically using a marching finite difference scheme to give approximate solutions for the velocity and temperature profiles. We highlight the effects of Nahme numbers, magnetic field, radiation and permeability parameters on both profiles. The results obtained are used to give graphical illustrations of the distribution of the flow variables and are discussed.

Full text

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