Magnetohydrodynamic Couette Flow of Fractional Burger's Fluid in an Annulus

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Abstract : Burgers' fluid with a fractional derivatives model in an annulus was analyzed. Combining appropriately the basic equations, with the fractionalized fractional Burger's fluid model allow us to determine the velocity field, temperature and shear stress. The governing partial differential equation was solved using the combine Laplace transformation method and Riemann sum approximation to give velocity field, temperature and shear stress on the fluid flow. The influence of various parameters like fractional parameters, relaxation time and retardation time, are drawn. The results obtained are simulated using Mathcad software and presented graphically. From the graphical results, we observed that the relaxation time and time helps the flow pattern, on the other hand, other material constants resist the fluid flow while fractional parameters effect on fluid flow is opposite to each other.

Keywords : sani isa, Ali musaburger's fluid, Laplace transform, fractional derivatives, annulus
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