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THERMOELECTRIC VISCOELASTIC FLUID WITH MODIFIED HEAT TRANSFER

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Abstract

A new mathematical model of MHD theory has been constructed in the context of a new consideration of heat conduction with a time- fractional derivative of order α $(0<\alpha\leq 1)$ and a time-fractional integral of order γ $(0<\gamma\leq 2)$. This model is applied to Stokes' first problem for a thermoelectric viscoelastic fluid over an infinite plate with heat sources distribution in the presence of a transverse magnetic field normal to the plate. Laplace transforms and state-space techniques [1] will be used to obtain the general solution for any set of boundary conditions. According to the numerical results and its graphs, conclusion about the new theory has been constructed. Some comparisons have been shown in figures to estimate the effects of the fractional order parameters on all the studied fields.

Key words: Viscoelastic fluid, Modified Fourier's and Ohm's laws, Modified Riemann-Liouville fractional integral, New fractional Taylor's series, State space approach, Fractional calculus.

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