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Investigation of variable thermo-physical properties of viscoelastic rheology: A Galerkin finite element approach
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Abstract
Galerkin finite element (GFEM) algorithm is implemented to investigate the variable viscosity, variable thermal conductivity and variable mass diffusion coefficient on viscoelasticity and non-Newtonian rheology of Maxwell fluid. Computer code is developed for weak form of FEM equations and validated with already published benchmark (a special case of present work). Theoretical results for velocities, temperature and concentration are displayed to analyze the effects of arising parameters including variable Prandtl number and variable Schmidt number. Shear stresses (only for Newtonian case) heat and mass fluxes at the elastic surface are computed and recorded in tabular form. © 2018 Author(s).

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