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Effect of the Convected Terms in the Transient Viscoelastic Flow NARIMAN ASHRAFI, MEYSAM MOHAMADALI, Young Researchers and Elites Club, Science and Research Branch, Islamic Azad University, Tehran, Iran — Influence of fluid elasticity is examined for the plane Couette flow (PCF) of an improved Johnson Segalman (J.S) fluid through introduction of coefficients in the convected terms. The flow field is obtained from the conservation and constitutive equations using the Galerkin projection method. Effect of several values of governing parameters such as introduced coefficients, Reynolds number and Weissenberg number on velocity and normal and shear stresses profiles are explored. The results show that the oscillating behavior of velocity profile tends to grow as the coefficients increase. For higher Wiessenberg, the oscillations are more intensive, whereas the amplitude of oscillation tends to reduce. This reveals that, the deviation decreases by increasing the coefficients. The amplitude of normal stress differences tend to grow as the coefficients of the convected terms grow, revealing more elastic behavior in the fluid. On the other hand; the effect of the convected terms on the steady behavior of normal stress difference is strongly dependent on the value of Weissenberg number. The shear stress behavior is also dependent on the coefficients of the convected terms and the flow properties, that is, for higher Reynolds the shear stress reaches a maximum and then decreases to minimum. For lower Reynolds, the opposite occurs.

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