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STUDY ON PULSATING FLOW OF A WORM-LIKE MICELLAR SOLUTION

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In this work, the rectilinear flow of a complex liquid under a pulsating, time- dependent pressure gradient is analyzed. The fluctuating component of the pressure gradient is assumed to be of small amplitude and can be adequately represented by a weakly stochastic process, for which a quasi-static perturbation solution scheme is suggested. The pulsating pressure-gradient flow is analyzed with the Bautista-Manero-Puig model (BMP) constitutive equation, consisting in the Upper Convected Maxwell equation coupled to a kinetic equation to account for the breakdown and reformation of the fluid structure. According to the BMP model, the flow enhancement is a function of the square of the amplitude of the oscillations, the Reynolds and Weissenberg numbers and the dimensionless numbers A and B (representing viscoelastic, kinetic and structural mechanisms). Thixotropy was found to have a negative effect on the energy associated to obtain the maximum flow enhancement. Finally, theoretical results are predicted using rheometric data for an aqueous wormlike micellar solution of cetyl trimethyl ammonium tosilate (CTAT) at different concentrations [1-3]