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EFFECT OF RANDOM LONGITUDINAL VIBRATIONS ON THE POISEUILLE FLOW OF A

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Abstract Text :   In this work, the rectilinear Poiseuille flow of a complex liquid flowing in a vibrating pipe is analyzed. The pipe
                         wall performs oscillations of small amplitude that can be adequately represented by a weak stochastic
                         process, for which a quasi-static perturbation solution scheme is suggested. The 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. A
                         drastic enhancement of the volumetric flow is predicted in the region where the fluid experiences
                         pronounced shear-thinning. Finally, flow enhancement is predicted using experimental data reported
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