

Abstract Submitted
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Stress diffusion in models for shear banding ELIAN MASNADA, PETER OLMSTED, Georgetown Univ — Understanding shear banding is of utmost importance from both theoretical and experimental point of view and consequently it has been studied for several decades [1]. Despite this study numerous aspects of shear banding remains poorly understood. Because of the intrinsic inhomogeneity in the shear banded state, applicable constitutive models must include spatial inhomogeneities, leading to a so-called 'diffusive' term in the equation of motion for the slow variables that carry stress [2,3]. Such terms are also vital in describing the interaction of bulk shear banding flows with walls and incorporation of wall slip. In this work, we consider different sources of 'diffusion' in polymer models in which concentration degrees of freedom are negligible. The simplest models used are consistent with diffusive terms whose origin is intrinsically dissipative, such as due to hydrodynamic interactions. By contrast, models in which elastic effects such as finite chain stiffness contribute to stress diffusion are inconsistent with simple diffusive models, and we propose alternative consistent models. [1] P. D. Olmsted, *Rheol. Acta*, 47, 283-300 (2008). [2] C.-Y. D. Lu et al, *Phys. Rev. Lett.*, 84, 642 (2000). [3] A. W. El-Kareh and L. G. Leal, *J. Non-Newton. Fluid Mech.*, 33, 257 (1989).

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