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**Elastic yielding after step shear and shear banding in LAOS: Is there any edge effect?** XIN LI, SHI-QING WANG, The University of Akron — One of the most striking findings in our recent exploration of nonlinear rheological behavior of entangled polymers is the discovery that a suddenly sheared sample cannot relax quiescently. In both solutions [1] and melts [2], particle-tracking velocimetric (PTV) observations reveal macroscopic motions after a large step shear. The present work takes a significant step forward to examine whether such cohesive failure upon shear cessation could arise from the experimental imperfection due to the presence of the free surface, i.e., the meniscus. By adopting a new setup to insure that the edge only undergoes a small strain and therefore suffers no failure of any kind, we determine how the sample interior would undergo elastic yielding in the form of macroscopic motions during stress relaxation upon a large step strain. The same device also allows us to illustrate that the previously observed shear banding in large amplitude oscillatory shear (LAOS) [3] is also an inherent response to the imposed LAOS, free of any edge effects. [1] S. Ravindranath and S. Q. Wang, Macromolecules 40, 8031 (2007). [2] P. Boukany and S. Q. Wang, Macromolecules, to be submitted (2009). [3] S. Ravindranath and S. Q. Wang, J. Rheol. 52, 341 (2008).

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