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Elastic breakup in extensional flow of entangled melts. YANGYANG WANG, POUYAN BOUKANY, SHI-QING WANG, University of Akron — In contrast to shear deformation, extensional flow behavior is more difficult to study because (a) the experimental system is always of finite dimensions and (b) the total strain in any given test is only finite. Despite uncertainties, there has been great deal of research carried out to explore various aspects of nonlinear behavior of entangled polymers. We applied our recently developed new theory [1] for flow of entangled polymers to predict the uniaxial stretching behavior of entangled melts. Specifically, we show that cohesive breakdown would take place, under the same conditions independent of molecular weight, during and after extension when the elastic force due to stretching overcomes a combination of the entanglement force and inter-chain frictional interactions. [1] *Phys. Rev. Lett.* **97**, 187801 (2006); full manuscript to be submitted to *J. Chem. Phys.*.

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