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**Paula Andrea Vasquez\*** (pvasquez@unc.edu), Chapel Hill, NC 27514, and **M Gregory Forest, Jeremy Cribb** and **Richard Superfine**. *Non-linear signatures of entangled polymer solutions in active microbead rheology*. Preliminary report.

We present an active microrheology protocol, based on magnetically driven microbeads, to measure and interpret nonlinear properties of entangled polymer solutions. The experimental signature is a bead take-off (acceleration) event, signaling a dynamic transition from a linear Stokes to a nonlinear response, while yielding linear and nonlinear properties. Simulations based on the Rolie-Poly model capture the behavior qualitatively, revealing the nonlinear transition as a dynamic strain-thickening event associated with chain entanglement distortions and stress accumulation at the bead surface. (Received August 29, 2011)