Three-dimensional viscoelastic flow instabilities at extensional stagnation points BECCA THOMASES, PALOMA GUTIERREZ, ADAM KAGEL, University of California, Davis — Simulations of viscoelastic fluid models in the Stokes limit exhibit instabilities at extensional stagnation points. We present simulations of both the Oldroyd-B and FENE-P models in a 3D periodic domain with cylindrical 4-roll mill background forcing. Beyond a critical Weissenberg number (non-dimensional relaxation time) we find an instability in the z-direction (note that the background force is constant in z). We present both simulations and linear stability analysis and identify criteria for the occurrence of this instability.

Becca Thomases
University of California, Davis