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A viscoelastic model with thixotropic yield stress behavior for filament stretching[1] YURIKO RENARDY, HOLLY GRANT, Virginia Tech — The transient behavior of filament stretching is studied for a viscoelastic constitutive model that combines a Partially Extending strand Convection model with a Newtonian solvent. The vertical filament is fixed at the bottom and the top is pulled up and held. Gravity and surface tension are also included in the model though they are not the primary mechanisms in this study. An axisymmetric circular slender jet approximation is applied. An asymptotic analysis for the initial stages of evolution is performed for large relaxation time, so that an interplay of fast and slow time scales emerges, and gives a criterion for whether the fluid yields immediately or whether slow dynamics ensues, depending on elastic stresses, gravity and capillary stress.

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