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Droplet pinch off of diluted polymer solutions CHRISTIAN WAGNER, RAINER SATTLER, Universitaet des Saarlandes, JENS EGGERS, University of Bristol — Tiny amounts of polymers can alter the flow behaviour of simple liquids dramatically. An aesthetic and instructive example is the detachment process of a droplet of a polymer solution, e.g. a diluted DNA solution. It is characterized by the suppression of the pinch off finite time singularity and the formation of a cylindrical filament between the droplet and the nozzle. On later stages of the experiments beads on a string are formed. Their generation can be well explained with scaling arguments of the intrinsic time scales of the experiment. The dramatic increase of resistance against the flow is macroscopically described by the elongational viscosity. It is a crucial parameter in many different industrial processes where contraction flows are generic. A pure elongational flow stretches the macromolecules at maximum and we use different experimental techniques simultaneously to relate macroscopic flow profiles with microscopic polymer configurations.

Christian Wagner
Universitaet des Saarlandes

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