Abstract Submitted
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Effects of viscoelasticity on droplet dynamics and break-up in microchannels : a Lattice Boltzmann study[1] ANUPAM GUPTA, Department of Physics and INFN, University of "Tor Vergata," Via della Ricerca Scientifica 1, 00133 Rome, Italy — The effects of viscoelasticity on the dynamics and break-up of liquid threads in microfluidic devices, i.e., T-junctions & Cross-Junction, are investigated using numerical simulations of dilute polymeric solutions for a wide range of Capillary numbers (Ca), i.e., changing the balance between the viscous forces and the surface tension at the interface. A Navier-Stokes (NS) description of the solvent based on the lattice Boltzmann models (LBM) is here coupled to constitutive equations for finite extensible non-linear elastic dumbbells with the closure proposed by Peterlin (FENE-P model). The various model parameters of the FENE-P constitutive equations, including the polymer relaxation time and the finite extensibility parameter, are changed to provide quantitative details on how the dynamics and break-up properties are affected by viscoelasticity.

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