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Diblock copolymer bridges: the break-up dynamics and enhanced stability of structured liquids

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Liquid bridges form when a liquid is stretched between two boundaries, creating a freestanding fiber. The break-up of simple Newtonian liquid bridges has been studied both theoretically and experimentally for a wide variety of different initial conditions since Plateau and Rayleigh considered the instability of a liquid jet. Though the break-up of liquid bridges composed of linear polymer melts and polymer solutions have been well studied, very little focus has been placed on the dynamics of diblock copolymer bridges. When annealed above the glass transition temperature and below the order-disorder transition temperature (ODT), diblock copolymers can organize into well-defined structures determined by the weight fraction of each polymer block. Conversely, as the temperature is increased above the ODT, the diblock will disorder and have properties more similar to a linear polymer melt. In this work, we monitor the evolution of diblock copolymer bridges to study the effect that diblock order has on dynamics and stability.

Author: PETERS, Robert (McMaster University)

Co-author: DALNOKI-VERESS, Kari (McMaster University)

Presenter: PETERS, Robert (McMaster University)

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