Measuring interfacial viscosity using macro- and micro-rheology

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Emory University — We measure the viscous moduli of thin films using two different methods. First, we use a magnetic needle viscometer. Our apparatus employs Helmholtz coils to control the position and orientation of the needle in the film. By driving the needle we can produce a response in the film which allows us to probe the bulk viscous properties of the film. Second, we use single particle microrheology to probe the local properties of the film. Tracking the mean-squared displacement of particles as they undergo Brownian motion probes the local viscous properties of any heterogeneous domains. Coupling this technique with the magnetic needle viscometer provides information on the effect local viscous properties have on the bulk properties.