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Effects of Sub-Phase Thickness on Interfacial Microrheology
PAUL CHRISTOPHEL MARTIN, KENNETH W. DESMOND, ERIC R. WEEKS, Emory University — The interface between two fluids is known to have a rheological response. In our work, we study human serum albumin protein molecules (HSA) at an air-water interface. Prior experimental work showed that the ratio of the surface viscosity to the sub-phase "bulk" viscosity influences the rheology of the HSA interface. Recent theoretical work has shown that the thickness of the sub-phase h can also influence the rheology of the interface. The finite thickness of the sub-phase only becomes important once h is on the order of the ratio of the surface viscosity to the sub-phase "bulk" viscosity, which is on the order of 100 microns for an HSA-air-water interface. To characterize the interfacial rheology, we suspend tracer particles at the interface, measure their correlated motions, and investigate how the results depend on h for water layers O(100 microns) thick.

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