Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Flow-Induced Droplet Deformation and Unjamming in Concentrated Emulsions under Large-Amplitude Oscillatory Shear JUNG-REN HUANG, THOMAS G. MASON, University of California-Los Angeles — We employ the technique of shear oscillation light scattering to study concentrated oil-in-water emulsions subjected to oscillatory shear that causes droplet deformation and restructuring. Three dimensionless scattering intensity anisotropy factors, defined using the primary and secondary Bragg peak intensities, reflect the degree of droplet deformation caused by the applied shear. These factors distinguish the soft-jamming regime, where shear causes positional disorder, from the sliding hexagonally closed-packed layer regime, where shear induces positional order. Furthermore, near and above the jamming limit of spherical particles, the shear-induced droplet structure depends sensitively on the droplet volume fraction and the shear history.

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Date submitted: 18 Nov 2008 Electronic form version 1.4