5 MEX

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The Rheologists'
Dream

Multi-scale study of the yielding transition!

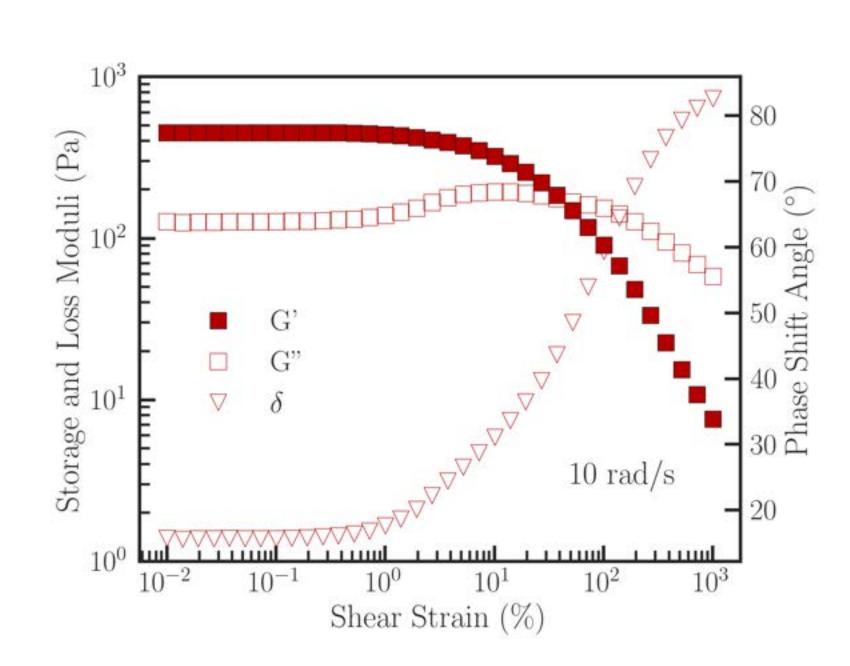
Coupling traditional rheology with optical microscopy!

Rheo-microscopy of Soft Materials

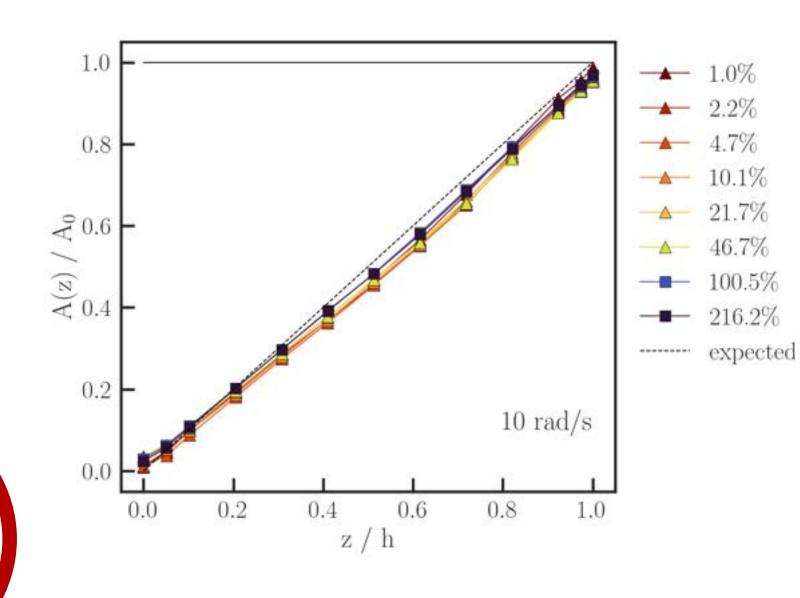
Carbopol 974P in propylene glycol seeded with 2.0 μm polystyrene particles 20x CMOS Particle tracking trigger box deflection signal

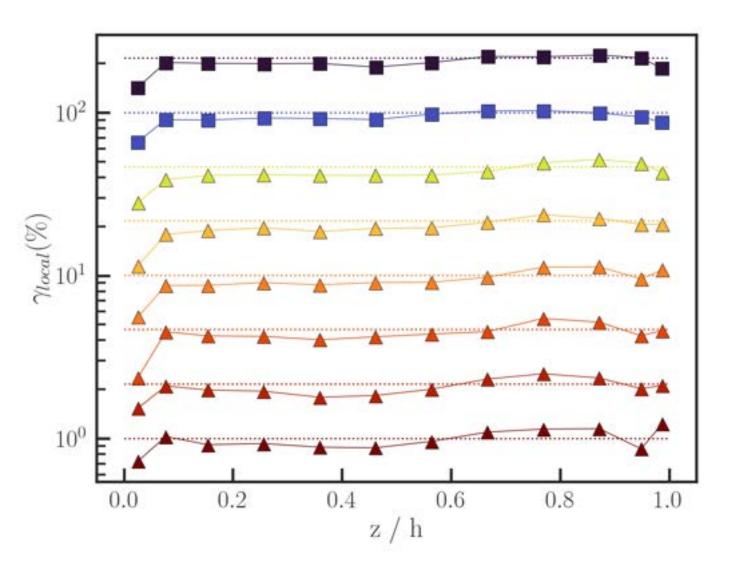
MACRO scale

- Transparent parallel plate geometry
- Type III behavior in the LAOS regime (loss modulus G' overshoot)
- Yield point around 40% strain



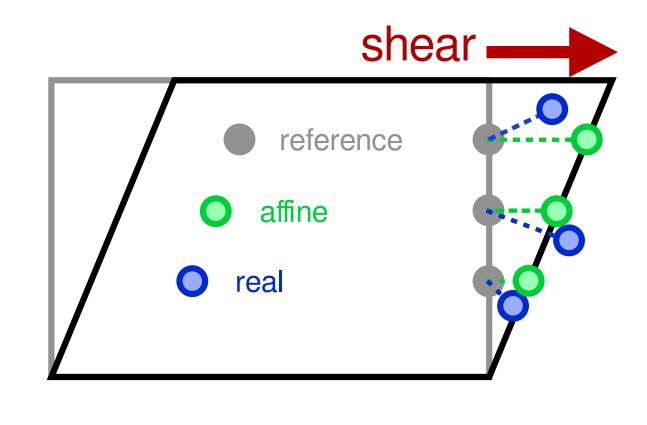
MESO scale

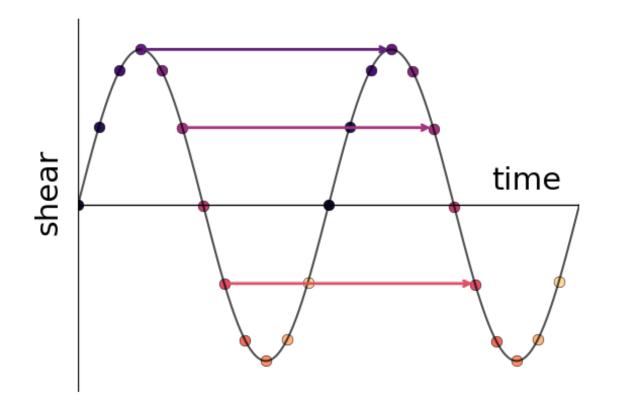




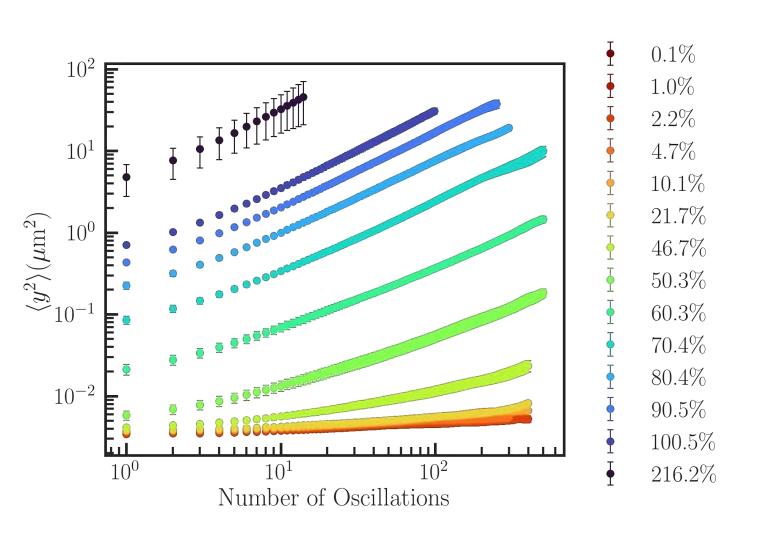
- Assesment of possible shear instabilities like wall slip and shear banding
- Direct measurement of the deformation profile (left)
 - -> Consistent between different sample loadings (marker shape)
- Calculation of the local strain (right)

MICRO scale

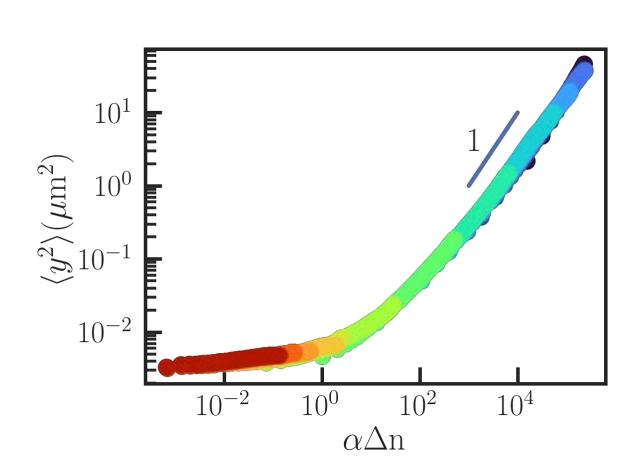


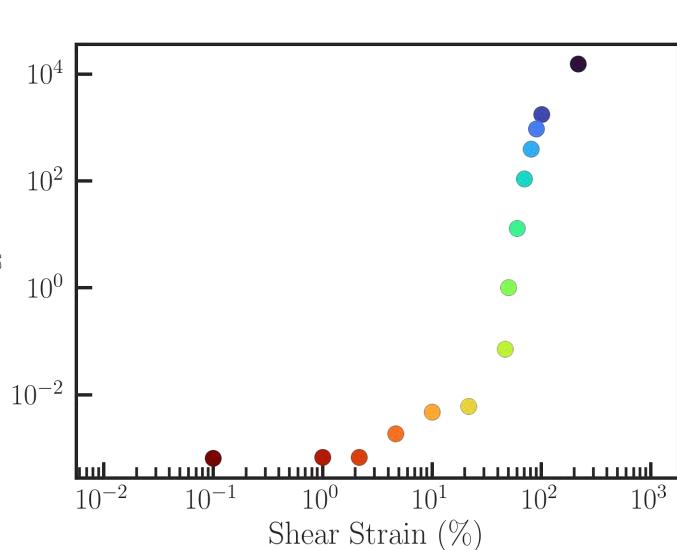


- Echo protocol to assess the non-affine displacements



- Mean square displacement in the vorticity direction (orthogonal to shear)
- Master curve constructed by horizontal shifting (right)
- Yield point around 46% strain





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