Abstract Submitted
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Traction force rheology: a new technique to understand the mechanics of colloidal solids. ZSOLT TERDIK[1], Harvard University — We present a new technique, traction force rheology, to directly measure the mechanical response of colloidal solids (crystals and glasses) in response to imposed shear strain, while observing the dynamics of individual colloidal particles. The technique consists of forming a composite bilayer consisting of a colloidal solid on top of a soft, polymer gel with embedded tracer particles. A precisely controlled shear strain is applied to the bilayer leading to controlled deformation of the colloidal crystal/glass. In addition to directly observing rearrangements and defects that occur within the colloidal crystal/glass during plastic deformation, we also measure the deformation of the tracer particles embedded in the polymer gel. Given the observed deformation of the polymer gel and the measured mechanical modulus, the traction forces exerted on the polymer gel by the colloidal solid can be inferred using traction force microscopy. Experimental details, challenges, and current results will be discussed.

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