

Abstract Submitted  
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**Direct experimental investigation of suspension microstructure**

BU XU, THARANGA PERERA, JAMES GILCHRIST, Lehigh University — Microstructure is key to understanding rheological behaviors of a flowing particulate suspension. Previous computational results reveal an anisotropic structure forming under high Péclet number conditions. An experimental technique based on confocal microscopy is developed to study microstructure of a colloidal suspension in a microchannel. Results of simulation-like quality are produced and the effect of  $Pe$  and interparticle force is investigated. Microstructure is shown to be consequential from competitions between hydrodynamic, thermal and electrostatic forces. The stress of suspension, calculated based on the microstructural information, is compared with previous computations.

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