

Abstract Submitted
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Viscosity and Shear Flows in Magnetized Dusty Plasmas C.A. ROMERO-TALAMAS, E.M. BATES, W.J. BIRMINGHAM, W.F. RIVERA, J. TAKENO, S. KNOP, University of Maryland, Baltimore County — Magnetized dusty plasma experiments are planned at the Dusty Plasma Laboratory of the University of Maryland, Baltimore County (UMBC), to investigate $E \times B$ rotation with dust of at least 500 nm in diameter. At this size, individual particles can be tracked and viscosity, shear flow, and temperature can be measured directly using a methodology similar to that used for linear shear flow configurations [Feng et al. PRL 109, 185002 (2012)]. The experiments are planned with a specially designed Bitter-type magnet that can be configured to achieve up to 10 T for at least 10 seconds, to minutes, with much longer operation times at lower fields also possible. At the highest field, the dust will be fully magnetized and thus we aim to achieve direct $E \times B$ rotation of the dust (and not just by ion drag). The motivation for these experiments comes from observations of electron and ion temperatures in excess of 100 eV in $E \times B$ rotating plasmas [R. Reid et al. Phys. Plasmas 21, 063305 (2014)]. The experimental setup and planned diagnostics for the magnetized dusty plasma are presented.

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