Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Turbulence in dilute polymer solutions ALEXANDRE DE CHAUMONT QUITRY, NICHOLAS T. OUELLETTE, Yale University — Turbulence in complex fluids encompasses many fascinating phenomena, ranging from drag reduction to elastic turbulence. We focus on inertial turbulence in a dilute polymer solution in order to understand how small changes a fluid's micro-scale properties result in large-scale flow changes. While there has been considerable progress in identifying such a mechanism in wall-bounded flows, it remains unclear in unbounded flows. We use Lagrangian Particle Tracking to measure the effect of 5 p.p.m by weight of polyacrylamide in water by imaging the central region of an experimental Von Karman flow, generated by placing counter-rotating impellers in a cylindrical chamber. While the fluid's viscosity hardly departs from that of water at such low concentrations, we observe a strong suppression of velocity fluctuations in the inertial range.

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Date submitted: 02 Aug 2013 Electronic form version 1.4