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**Effect of polymer additives on high order Lagrangian structure functions of a turbulent flow** MIREIA TORRALBA, MPI Dynamics & Self-Organization (MPIDS) and International Collaboration for Turbulence Research (ICTR), HAITAO XU, MPIDS and ICTR, EBERHARD BODENSCHATZ, MPIDS and ICTR and LASSP, Cornell University — According to K41 predictions, Lagrangian high-order moments of the velocity differences should display a universal scaling in the inertial range. Lagrangian Particle Tracking (LPT) measurements and DNS in Newtonian turbulence revealed an anomalous scaling substantially different from that predicted by K41 (N. Mordant et al. 2001 PRL 87 214501, H. Xu et al. 2006 PRL 96 024503, L. Biferale et al. 2005 Phys. Fluids 17 021701). Here we report the high-order Lagrangian structure functions measured in turbulent dilute polymer solutions. We used the LPT technique to perform the measurements in an axisymmetric turbulent flow at moderate Reynolds numbers to avoid polymer degradation. The Weissenberg numbers were above unity and the polymers were stretched by the flow. Under these conditions the polymers were able to exchange energy with the flow and to modify the dynamics of turbulence. The scaling behavior of the dilute polymer solution structure functions is strikingly different from the one observed for Newtonian flows at the same Reynolds number.

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