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Single polymer stretching in elastic turbulence of polymer solution YONGGANG LIU, VICTOR STEINBERG, Department of Physics of Complex Systems, Weizmann Institue of Science — Coil-stretch transition of single T4 DNA molecule in an elastic turbulence is studied in a polymer solution with the same molecules. Two mechanisms of saturation of polymer stretching in elastic turbulence, the nonlinearity of polymer stretching and the back reaction of stretched polymer chains to the flow, are demonstrated based on experiments of single polymer dynamics at different polymer concentrations. The elastic stress calculated from single polymer stretching agrees with the PIV measurement of the flow properties, indicating that polymer stretching can be used as an elastic stress probe of the flow properties.

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