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Measurements of the Multifractal Dimension of Lagrangian Turbulence¹ NICHOLAS OUELLETTE, HAITAO XU, Cornell University, EBERHARD BODENSCHATZ, Cornell University and Max Planck Institute for Dynamics and Self-Organization — We report experimental measurements of the Lagrangian multifractal dimension spectrum in an intensely turbulent laboratory water flow by the optical tracking of tracer particles. These measurements are compared with three model dimension spectra. The Legendre transform of the measured spectrum is compared with measurements of the scaling exponents of the Lagrangian structure functions, and excellent agreement between the two measurements is found.

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