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**Lagrangian velocity structure functions in high reynolds number turbulence**[1] HAITAO XU, LASSP, Cornell University, NICHOLAS OUELLETTE, LASSP, Cornell University, MICHAEL BOURGOIN, Laboratoire des Ecoulements Geophysiques et Industriels, CNRS, France, EBERHARD BODENSCHATZ[2], Max Planck Institute for Dynamics and Self-Organization, Goettingen, Germany, INTERNATIONAL COLLABORATION FOR TURBULENCE RESEARCH COLLABORATION — We report measurements of the Lagrangian velocity structure functions, up to order 10, in a high Reynolds number (up to a Taylor microscale Reynolds number $R_\lambda = 815$) turbulence experiment, in which the motion of passive tracer particles was followed optically in three dimensions using multiple high speed cameras. We measure the scaling exponents of the Lagrangian structure functions using the extended self-similarity hypothesis, and compare our experimental data with previous measurements and DNS data. This work is supported by the NSF and the Max Planck Society.

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