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Lagrangian Measurements of Inertial Particles in Wind Tunnel Turbulence ARMANN GYLFASON, SATHYA AYYALASOMAYAJULA, ZELLMAN WARHAFT, Cornell University — A large wind tunnel ($1 \times 1 \times 20$ m) with an active grid and a micro water spray system is being used to study the Lagrangian tracks of inertial particles ($0.1 < St < 10$) in high Reynolds number decaying turbulence ($50 < R_\lambda < 1000$). We present results from 2D measurements of the inertial particle tracks, focusing on velocity structure functions and probability density functions, and discuss their extension to the 3D case. We describe the stringent specifications for such an experiment in which the high speed cameras are made to move with the mean velocity of the flow, and outline the methods used to correct for the vibrations of the equipment. The work is motivated by the need to understand the growth rate of water droplets in clouds and the clustering of aerosols in turbulent flows. Support is provided by the US National Science Foundation (NSF).

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