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**Lagrangian measurements of inertial particle trajectories in a turbulent boundary layer** SERGIY GERASHCHENKO, NICOLE SHARP, STEPHANIE NEUSCAMMAN, SATHYANARAYANA AYYALASOMAYAJULA, ZELLMAN WARHAFT, Cornell University — We describe Lagrangian measurements of water droplets in a boundary layer with high Reynolds number free stream turbulence. The high Reynolds number turbulence is produced using a active grid in a wind tunnel. Water droplets are introduced into the flow using an array of nozzles attached down stream of the active grid. A boundary layer is formed above a glass plate and the particle trajectories are tracked by a high speed camera moving along side of the tunnel [Ayyalasomayajula et al Phys. Rev. Lett., 97, 2006). We show that the probability density function of the acceleration of the particles in the boundary layer has stretched exponential tails that have pronounced asymmetry, reflecting the deceleration events as the particles approach the wall. The pdf's are measured as a function of distance from the wall and the free stream turbulence level is also varied in order to change the turbulence characteristics in the boundary layer. The Stokes number of the particles is varied up to a value of approximately 0.2.

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