

Abstract Submitted  
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**Bringing Clouds into Our Lab! - The Influence of Turbulence on the Early Stage Rain Droplets**<sup>1</sup> MEHMET ALTUG YAVUZ, RUDIE KUNNEN, GERTJAN HEIJST, HERMAN CLERCX, Fluid Dynamics Laboratory, Department of Physics, Eindhoven University of Technology, Netherlands — We are investigating a droplet-laden flow in an air-filled turbulence chamber, forced by speaker-driven air jets. The speakers are running in a random manner; yet they allow us to control and define the statistics of the turbulence. We study the motion of droplets with tunable size (Stokes numbers  $\sim 0.13 - 9$ ) in a turbulent flow, mimicking the early stages of raindrop formation. 3D Particle Tracking Velocimetry (PTV) together with Laser Induced Fluorescence (LIF) methods are chosen as the experimental method to track the droplets and collect data for statistical analysis. Thereby it is possible to study the spatial distribution of the droplets in turbulence using the so-called Radial Distribution Function (RDF), a statistical measure to quantify the clustering of particles. Additionally, 3D-PTV technique allows us to measure velocity statistics of the droplets and the influence of the turbulence on droplet trajectories, both individually and collectively. In this contribution, we will present the clustering probability quantified by the RDF for different Stokes numbers. We will explain the physics underlying the influence of turbulence on droplet cluster behavior.

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