

Turbulent clustering of low-inertia droplets: an important process in the dynamics of clouds

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Abstract. Several effects of turbulence may reduce the time for rain initiation in warm (ice-free) atmospheric clouds. This talk overviews the effect of turbulent clustering of inertial droplets that interact hydrodynamically. Using the so-called drift-diffusion model (based on the Master equation satisfied by the probability of finding two droplets separated by a given distance) it is shown that hydrodynamic interactions have strong impact on clustering at small (sub-Kolmogorov) length scales [1]. This enhances droplet collision probabilities and may accelerate precipitation formation. Mechanisms for droplet clustering at larger length scales (in the inertial range of isotropic turbulence) are also discussed [2].

References

- [1] M. A. Yavuz *et al.*, Phys. Rev. Lett. **120**, 244504 (2018).
- [2] A. D. Bragg, P. J. Ireland, and L. R. Collins, Phys. Rev. E **92**, 023029 (2015).