

Abstract Submitted
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Rapid growth of cloud droplets by turbulence JOHN CHRISTOS VASSILICOS, VASSILIS DALLAS, Imperial College London — Assuming perfect collision efficiency, we demonstrate that turbulence can initiate and sustain rapid growth of very small water droplets in air even when these droplets are too small to cluster, and even without having to take gravity and small-scale intermittency into account. This is because the range of local Stokes numbers of identical droplets in the turbulent flow field is broad enough even when small-scale intermittency is neglected. This demonstration is given for turbulence which is one order of magnitude less intense than typically in warm clouds but with a volume fraction which, even though small, is nevertheless large enough for an estimated a priori frequency of collisions to be ten times larger than in warm clouds. However, the time of growth in these conditions turns out to be one order of magnitude smaller than in warm clouds.

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