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**Effect of large-scale flow forcing scheme on turbulent collision statistics of inertial particles**[1] HOSSEIN PARISHANI, BOGDAN ROSA, LIAN-PING WANG, U. Delaware, WOJCIECH GRABOWSKI, NCAR — Direct numerical simulations (DNS) of turbulent collision of small inertial particles such as cloud droplets rest on an implicit assumption that the collision statistics of inertial particles are mainly governed by turbulent motion in the dissipation-range. Because of the potential coupling between dissipation-range scales and the energy-containing scales (i.e., vortical structure and intermittency), the limited resolution or scale separation in DNS, and the likely response of an inertial particle to a range of fluid motion, the nature of large-scale forcing used to maintain the stationarity of fluid turbulence could have some impact on the collision statistics of inertial particles. Here we compare results obtained from two forcing schemes: a stochastic forcing scheme and a deterministic forcing scheme. We focus on statistics related to the geometric collision including preferential concentration, radial distribution function, radial relative velocity, and dynamic collision rate for a range of droplet sizes and flow dissipation rates relevant to atmospheric clouds. Using an MPI implementation of DNS of turbulent collisions, we can also examine the effect of forcing scheme at several different flow Reynolds numbers or scale separations.

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