

Abstract Submitted
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Towards quantifying the collision kernel of inertial particles in homogeneous isotropic turbulence JUAN P.L.C. SALAZAR, Cornell University, JEREMY DE JONG, SCOTT H. WOODWARD, HUI MENG, University at Buffalo - The State University of New York, LANCE R. COLLINS, Cornell University — We present digital holographic particle image velocimetry (DHPIV) measurements of the radial distribution function (RDF) and the relative velocity probability density function (PDF) of inertial particle pairs in homogeneous isotropic turbulence generated by fans in an enclosed box. The RDF and relative velocity PDF are the essential statistical inputs to the particle-pair collision kernel (Sundaram & Collins 1997). The measurements are compared to direct numerical simulations (DNS) at a similar Reynolds number. Results show qualitative agreement of the relative velocity PDF from experiments and DNS. Measurements of the temporal development of the RDF demonstrate the existence of an extended quasi-steady-state regime, over which comparisons of the measured two-particle statistics to DNS can be made, justifying a previous RDF comparison by Salazar et al (2008). Further considerations of finite-volume effects on the RDF are considered.

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