Gravity influence on the clustering of charged particles in turbulence[1] JIANG LU, HANSEN NORDSIEK, RAYMOND SHAW, Department of Physics, Michigan Technological University — We report results aimed at studying the interactions of bidisperse charged inertial particles in homogeneous, isotropic turbulence, under the influence of gravitational settling. We theoretically and experimentally investigate the impact of gravititational settling on particle clustering, which is quantified by the radial distribution function (RDF). The theory is based on a drift-diffusion (Fokker-Planck) model with gravitational settling appearing as a diffusive term depending on a dimensionless settling parameter. The experiments are carried out in a laboratory chamber with nearly homogeneous, isotropic turbulence in which the flow is seeded with charged particles and digital holography used to obtain 3D particle positions and velocities. The derived radial distribution function for bidisperse settling charged particles is compared to the experimental RDFs.

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