Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Wake-driven dynamics of finite-sized buoyant spheres in turbulence VARGHESE MATHAI, VIVEKN PRAKASH, JON BRONS, CHAO SUN, DETLEF LOHSE, Univ of Twente, PHYSICS OF FLUIDS GROUP TEAM — Particles suspended in turbulent flows are affected by the turbulence, and at the same time act back on the flow. The resulting coupling can give rise to rich variability in their dynamics. Here we report experimental results from an investigation on finite-sized buoyant spheres in turbulence. We find that even a marginal reduction in the particles density from that of the fluid can result in strong modification of the particle dynamics. In contrast to classical spatial filtering arguments, we find that the particle acceleration variance increases with size. We trace this reversed trend back to the growing contribution from wake-induced forces.

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Date submitted: 27 Jul 2015 Electronic form version 1.4