Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Lagrangian statistics in rotating turbulence LORENZO DEL CASTELLO[1], H.J.H. CLERCX, R.R. TRIELING, TU/e, A. TSINOBER[2], IC —
Background rotation becomes important when the ratio of the nonlinear acceleration over the Coriolis force becomes small enough. The Coriolis force has an anisotropic effect on the flow, and leads to the formation of columnar vortex structures and Ekman boundary layers close to the horizontal no-slip boundaries. The first aim of this work is to feed the fundamental investigation of turbulence with experimental data, giving further insight into the anisotropic effects of rotation on turbulent particle-pair dispersion and quantifying this anisotropy through the comparison of the horizontal (normal to the rotation axis) dispersion and the reduced vertical one, together with some other relevant manifestations of anisotropy. A series of experiments of electromagnetically forced turbulence ($Re_\lambda \sim 150$) is performed in a confined tank put on a rotating table and the Rossby number is varied between 1 and 0.08. A 3D-PTV technique is used to extract trajectories in a volume comparable with the integral scale of the flow and with space- and time-resolutions adequate to resolve the Kolmogorov scales.

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Date submitted: 29 Jul 2008 Electronic form version 1.4