

Abstract Submitted
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Stereoscopic PIV measurements in electromagnetically forced rotating turbulence H.J.H. CLERCX¹, L.J.A. VAN BOKHOVEN, G.J.F. VAN HEIJST, R.R. TRIELING, TU/e — A novel laboratory experiment has been set up for studying effects of rotation on (inhomogeneous) turbulence. Rotating turbulence plays an important role in fields as diverse as engineering, geophysics, and astrophysics. Three-dimensional turbulence is generated near the bottom of a square fluid container using electromagnetic forcing. Typical Taylor-based Reynolds numbers are of the order of 150-200. A stereoscopic PIV technique is used for quantifying the two-dimensionalisation by rotation. From the many results, we mention here the linear scaling of the structure function exponents in presence of rotation, as reported recently by Baroud et al. [Phys. Rev. Lett. 88, 4501 (2002)]. The scaling is anomalous with respect to the theoretical prediction for self-similar homogeneous isotropic turbulence.

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