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Statistics of velocity fluctuations in turbulent Couette-Taylor flow

CHAO SUN, SANDER HUISMAN, DENNIS VAN GILS, DETLEF LOHSE, Physics of Fluids group, University of Twente — Azimuthal and axial velocity fluctuations between concentric cylinders were measured using Laser Doppler Anemometry in a turbulent Taylor-Couette apparatus. We measured the velocity fluctuations in the middle of the gap and near the outer wall, for pure inner cylinder and counter-rotating cylinders at a fixed Reynolds number of 2×10^6 . The velocity structure functions calculated using extended self-similarity exhibit clear power-law scaling. The transverse and longitude structure function exponents have been compared in two measurement positions.

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