

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Time-resolved PIV in fully developed turbulent pipe flow LEO HELLSTRÖM, AMAN SINHA, ALEXANDER SMITS, Princeton University — Stereoscopic particle image velocimetry was used to study the three-component velocity field in fully developed turbulent pipe flow, to investigate the structure and behavior of the large and very large scale motions in the outer layer. The data was acquired with a high speed camera, making it possible to resolve the velocity field in time for Reynolds numbers ranging from 1.3×10^4 to 3.6×10^4 . The data corresponds to a displacement of approximately 20 diameters. The observed velocity fluctuations and the azimuthal two point correlations are consistent with previous studies, showing the existence of very large scale coherent structures. Proper Orthogonal Decomposition was performed on the data to further investigate the structures.

Leo Hellström
Princeton.edu

Date submitted: 09 Aug 2010

Electronic form version 1.4