



Turbulence length scales in a vortical flow

Submitted by Thierry Lemenand on Fri, 03/13/2015 - 18:52

Titre Turbulence length scales in a vortical flow
Type de publication Communication
Type Communication avec actes dans un congrès
Année 2011
Langue Anglais
Date du colloque 24-29/07/2011
Titre du colloque AJK2011 ASME-JSME-KSME Joint Fluids Engineering Conference
Pagination 6
Auteur Habchi, Charbel [1], Lemenand, Thierry [2], Della Valle, Dominique [3], Peerhossaini, Hassan [4]
Pays Japon
Editeur ASME (American Society of Mechanical Engineers)
Ville Hamamatsu

Résumé en anglais Laser Doppler velocimetry is used to investigate the velocity spectra and turbulence length scales in a turbulent vortical flow. The turbulent vortical flow is ensured by vorticity generators (VGs) inserted into a straight circular pipe. Each VG generates a complex flow that is mainly the combination of a steady streamwise counter-rotating vortex pair and a periodic sequence of hairpin-like structures caused by the Kelvin-Helmholtz instability in the shear layer ejected from the VG trailing edges. These primary structures induce a secondary vorticity in the wake of the VG. The aim of the study is to analyze the velocity spectra and turbulent length scales for the different coherent structures in the flow. Thus, the Kolmogorov and Taylor microscales, the Liepmann-Taylor microscale and the viscous length scale are determined in different locations in the VG streamwise direction. The evolution of the length scales with respect to the Taylor-Reynolds number is compared with theoretical trends in a variety of flows in the open literature.

URL de la notice <http://okina.univ-angers.fr/publications/ua8842> [5]

Liens

- [1] [http://okina.univ-angers.fr/publications?f\[author\]=15323](http://okina.univ-angers.fr/publications?f[author]=15323)
- [2] <http://okina.univ-angers.fr/t.lemenand/publications>
- [3] [http://okina.univ-angers.fr/publications?f\[author\]=15326](http://okina.univ-angers.fr/publications?f[author]=15326)
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=15328](http://okina.univ-angers.fr/publications?f[author]=15328)
- [5] <http://okina.univ-angers.fr/publications/ua8842>

Publié sur *Okina* (<http://okina.univ-angers.fr>)