

Documentation for Research Dataset

Introduction

This dataset contains velocity data for the following article:

Zhdanov O., Jelly T.O. and Busse, A. (2023) Influence of ridge spacing, ridge width, and Reynolds number on secondary currents in turbulent channel flow over triangular ridges. *Flow, Turbulence and Combustion* (doi: 10.1007/s10494-023-00488-1)

Surfaces

The geometric definition of the surfaces with triangular ridges can be found in the article.

Dataset

A velocity data file is provided for each surface. The naming convention is as follows: for the surfaces with varied ridge spacing at constant ridge base width, the files are named VelocityData_s_*_*.csv where * is replaced by the ridge spacing and ** by the friction Reynolds number. For the surfaces with varied ridge base width at constant ridge spacing, the files are named VelocityData_b*_550.csv where * is replaced by the ridge base width. Also provided are data for the smooth-wall reference cases.

Table 1 gives an overview of the column layout. For the computation of the velocity data intrinsic averaging was applied, i.e., averages are taken over the fluid occupied area only. All velocity data are normalised with the friction velocity u_τ which is based on the constant mean streamwise pressure gradient and the channel half-height δ .

Table 1 Column layout for velocity statistics files

Column	Contents	Comments
1	z/δ	Wall-normal location
2	$\langle \bar{u} \rangle / u_\tau$	Mean velocity
3	$\langle \overline{u'u'} \rangle / u_\tau^2$	Streamwise normal Reynolds stress
4	$\langle \overline{u'w'} \rangle / u_\tau^2$	Reynolds shear stress
5	$\langle \tilde{u}\tilde{w} \rangle / u_\tau^2$	Dispersive shear stress (<i>not applicable for smooth-wall cases</i>)

Further information

In case of questions about this dataset, please contact the authors.