

# Documentation for Research Dataset

## Introduction

This dataset contains velocity and spanwise pressure gradient data for the following article: Zhdanov O. and Busse, A. (2024) Net spanwise flow induced by symmetry-breaking streamwise homogeneous surfaces. *Journal of Fluid Mechanics* (doi:10.1017/jfm.2024.634)

## Surfaces

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

## Dataset

A file containing velocity and spanwise pressure gradient data is provided for each ridged surface. The naming convention is as follows: for surfaces with ridges, the files are named Data\_R\*.csv where \* is replaced by the ratio of the ridge side slopes. Also provided are data for the smooth-wall reference case.

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  $u_\tau$  which is based on the constant mean streamwise pressure gradient and the channel half-height  $\delta$ .

Table 1 Column layout for velocity statistics files

Column	Contents	Comments
1	$z/\delta$	Wall-normal location
2	$\langle \bar{u} \rangle / u_\tau$	Mean streamwise velocity
3	$\langle \bar{v} \rangle / u_\tau$	Mean spanwise velocity
4	$\langle \overline{v'w'} \rangle / u_\tau^2$	In-plane Reynolds shear stress
5	$\langle \tilde{v}\tilde{w} \rangle / u_\tau^2$	In-plane dispersive shear stress ( <i>not applicable for smooth-wall cases</i> )
6	$\partial \langle \bar{p} \rangle^+ / \partial (y/\delta)$	Spanwise pressure gradient ( <i>not applicable for smooth-wall cases</i> )

## Further information

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