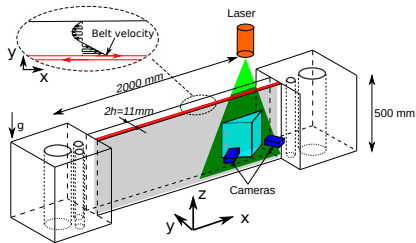


# Interaction between structures in a Couette-Poiseuille flow

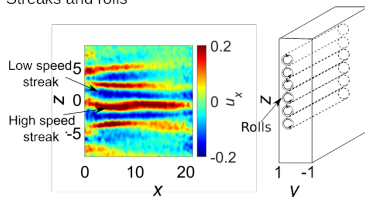
Benoît Semin, Tao Liu, Ramiro Godoy-Diana, José Eduardo Wesfreid

PMMH, CNRS, ESPCI Paris, PSL, Sorbonne Université, Université Paris Cité



Couette-Poiseuille channel

Streaks and rolls



Structures :

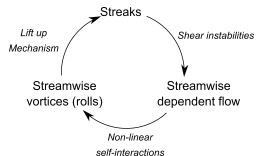
- streaks, i.e. fluctuations of the streamwise velocity  $u_x$
- rolls, i.e. streamwise vortices

# Self-sustaining process

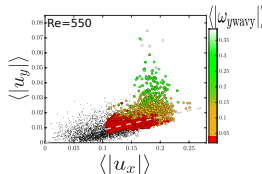
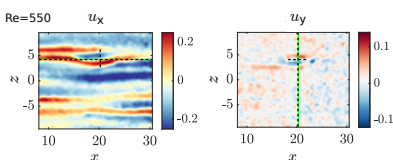
Many **theoretical/numerical** works :

- F. Waleffe 1997
- B. Farrel & P. Ioannou 2012
- P. Manneville 2018
- J. Bae et al 2021
- A. Cavalieri et al 2022
- ...

Self-sustaining process linked to interaction between structures



Poster : **experiments** on the interaction between structures



Waviness

Lift-up

- T. Liu, B. Semin, L. Klotz, R. Godoy-Diana, J. E. Wesfreid and T. Mullin, Decay of streaks and rolls in plane Couette-Poiseuille flow, J. Fluid Mech. (2021)
- T. Liu, B. Semin, R. Godoy-Diana and J. E. Wesfreid, Lift-up and streak waviness drive the self-sustained process in wall-bounded transition to turbulence, Phys. Rev. Fluids (2024)