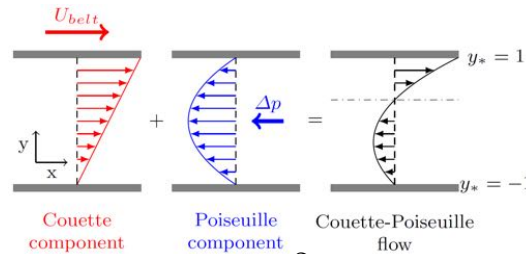
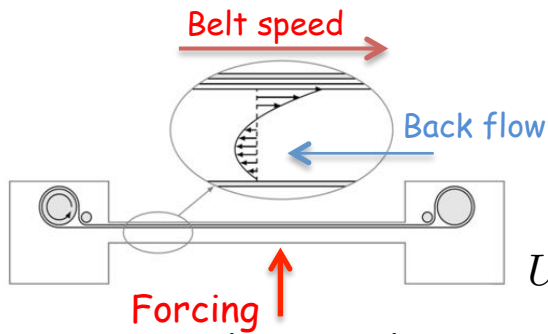


# NEW EXPERIMENTS ON SUBCRITICAL TRANSITION TO TURBULENCE IN COUETTE-POISEUILLE FLOW

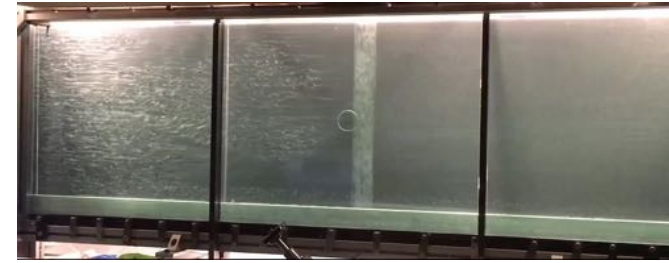
Lukasz KLOTZ and José Eduardo WESFREID - PMMH-ESPCI, Paris

## EXPERIMENTAL SET-UP IN PLANE COUETTE-POISEUILLE CONFIGURATION



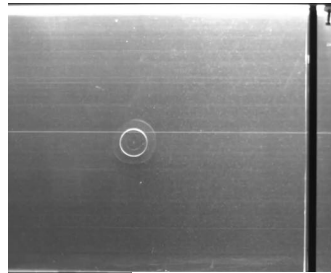
$$U(y_*) = \sigma_1(1 - y_*^2) + \sigma_2(y_* + 1)$$

Flow always **STABLE** linearly

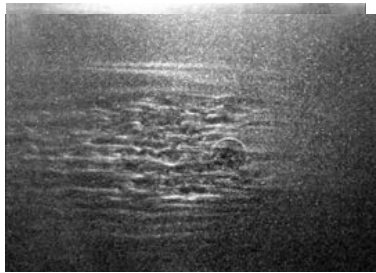


Zero mean advection velocity

**VISUALIZATION OF DIFFERENT FLOW REGIMES - NATURAL TRANSITION TO TURBULENCE DUE TO THE INTRINSIC NOISE OF THE EXPERIMENTAL SET-UP**



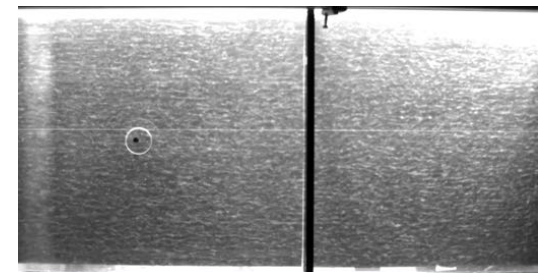
Laminar flow  
( $Re < 580$ )



Turbulent spot  
( $Re = 630$ )

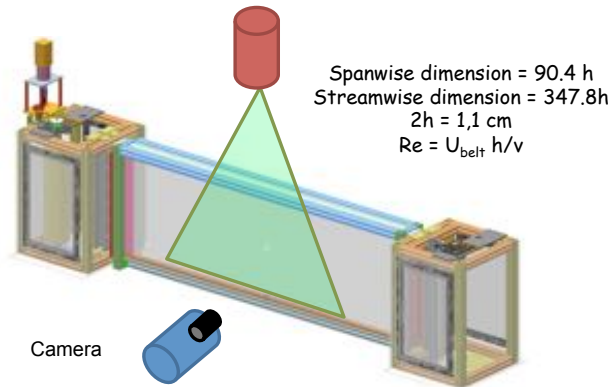
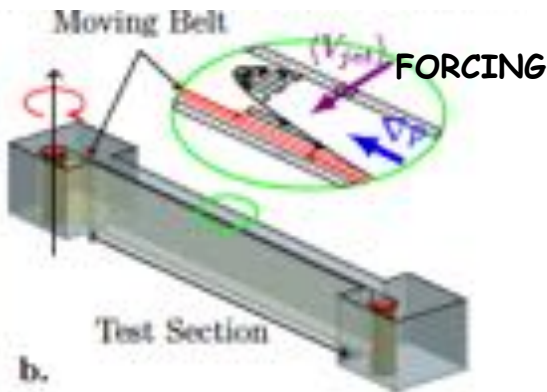


Laminar-turbulent bands  
( $Re = 670$ )

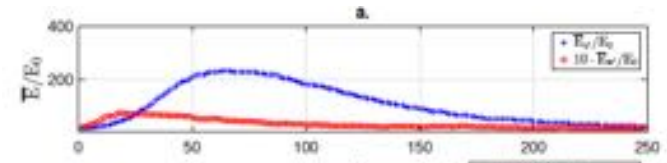


Turbulent flow  
( $Re = 1000$ )

Re

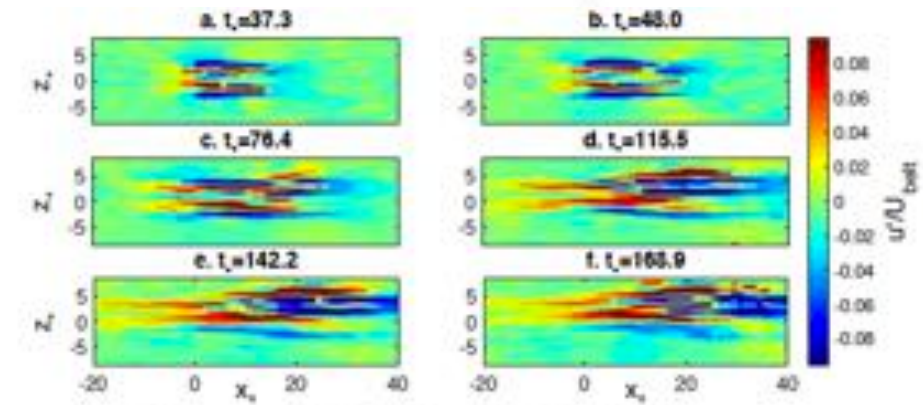
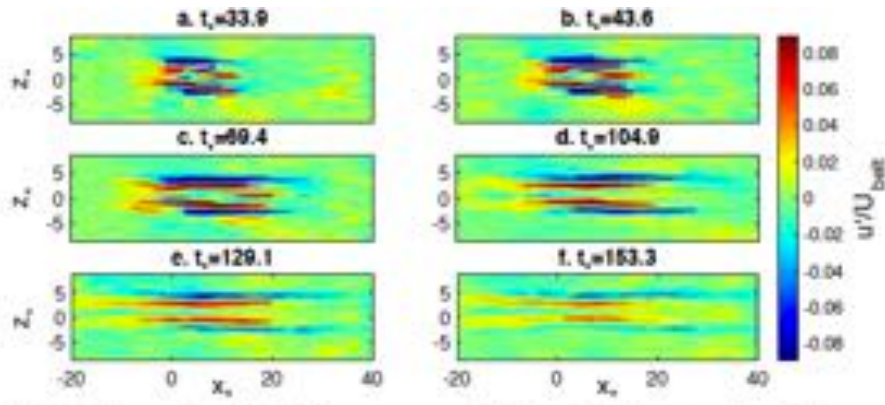
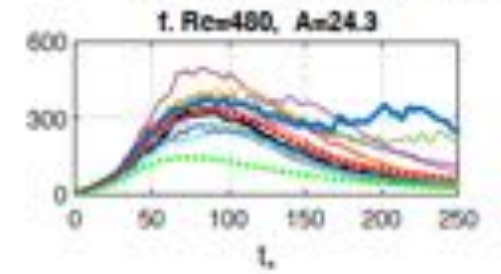
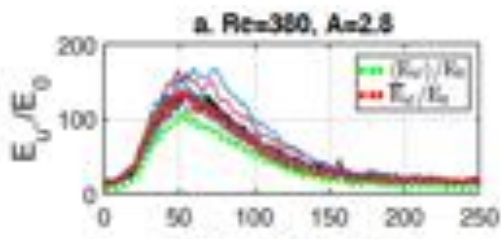


**Weak and short forcing**



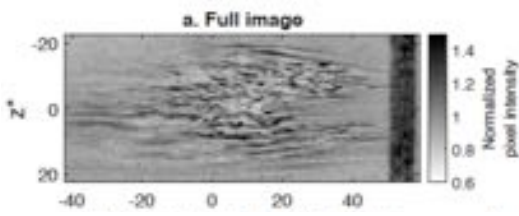
streamwise perturbation (streaks)  
spanwise perturbation (rolls)

# SPOT INDUCED BY A VERY SHORT EXTERNAL PERTURBATION AND SPATIO-TEMPORAL REPNSE: TRANSIENT GROWTH AND SELF SOUSTAINED CASES

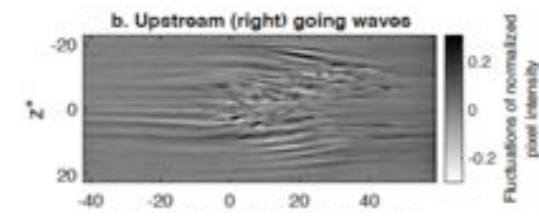


*As in edge states*

## TRAVELLING WAVES



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