

Abstract Submitted  
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**New experiment in Plane Poiseuille flow with zero mean advection velocity: observation of stationary turbulent spots** LUKASZ KLOTZ, PMMH/ ESPCI-CNRS, GREGOIRE LEMOULT, IST Austria, JOSE EDUARDO WESFREID, PMMH/ ESPCI-CNRS — We describe a new experimental set-up which allows us to study the sub-critical transition to turbulence in a two dimensional shear flow (including plane Couette, plane Couette-Poiseuille and plane Poiseuille flows). Our facility is an extension of a classical plane Couette experiment, in which one uses a single closed loop of plastic belt to generate the opposite sign velocity at each wall of the test section. However, in our case, we use two independent closed loops of plastic belt, one at each wall of the test section. The speed of these belts may be controlled separately. That enables to set two different velocities (in value and direction) as a boundary conditions at each of two test section's walls. In addition the pressure gradient in streamwise direction can be controlled. In particular, the plane Poiseuille flow with zero mean advection velocity can be created. We characterize by PIV the basic flow for different configurations. For a plane Poiseuille flows as base flow, we were able to observe for the first time the nearly stationary turbulent spots in this flow, with structures of characteristic wavelength  $\sim$  the distance between the two plates.

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