

Fluid Dynamics Seminar

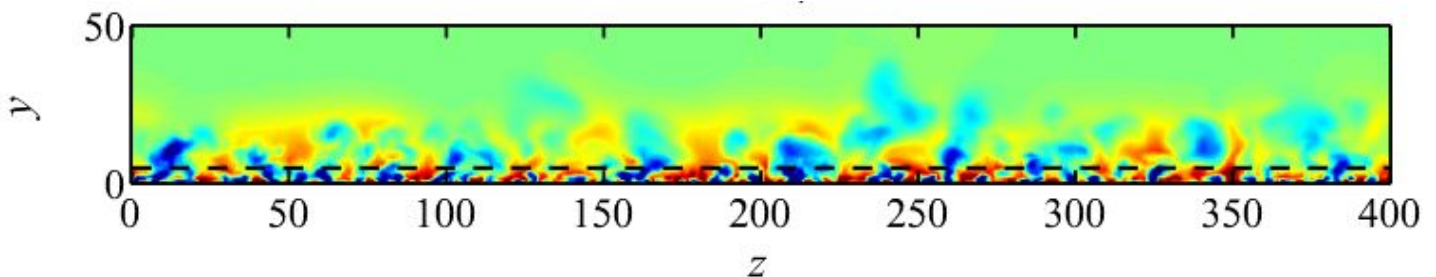
Date: Wednesday, December, 13, 2017 at 13:00

Location: ZARM, Room 1730

Spatial intermittency and multiscale aspects of transitional shear flows

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Cross-stream cut of isolevels of streamwise velocity fluctuations in an Asymptotic Suction Boundary layer flow at the verge of relaminarisation, spectral numerical simulation ($Re=260$), from Khapko, Schlatter, Duguet & Henningson, JFM 795 (2016).

Planar shear flows are encountered in many applications such as ducts, heat exchangers and geophysical boundary layers. The occurrence of sustained turbulence in such geometries results from a competition between laminar flow and non-trivial flow motion. We focus in this talk on the occurrence of large-scale spanwise motions in the low-Reynolds number, so-called 'transitional' regime. Such large-scale motions can sustain spatio-temporal intermittency in the case of a wall-bounded channel. Surprisingly the situation happens to be different in boundary layer geometries, even in the parallel boundary layers realised in the presence of wall suction, where no proper transition range is identified. We will discuss this lack of universality and show how it connects with the infamous occurrence of large-scale motions found in the opposite high-Reynolds number limit.