XX Fluid Mechanics Conference KKMP2012,
Gliwice, 17-20 September 2012

REVISITING NEAR WALL TURBULENCE PHYSICS

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Wall turbulence is of key importance for many applications of practical interest, including aircraft, car, train, turbomachinery… Presently, this flow region is modelled based on the limited existing knowledge about zero pressure gradient boundary layers and plane channel flow, leading to crude approximation of the reality. Recent progress in both numerical simulation and advance optical diagnostic tools allow to dive deeply and quantitatively into the internal turbulence organisation. The large piece of research performed in the second half of the 20th century can be revisited on this basis, giving good insight into the near wall turbulence physics. The aim of the presentation will be to give an overview of the recent advances on this topic performed at Ecole Centrale de Lille, notably in the frame and in the follow up of the European research project WALLTURB.