英語講演会　事前申込不要

東北大学大学院工学研究科　次世代航空機研究センターからのお知らせ

TU Next Seminar in Applied Mechanics and Computational Engineering

日時：2019 年 7 月 12 日（金）, July 12nd 2019, 16：00-17：00

場所：東北大学大学院工学研究科　機械・知能系共同棟 6F 611 号室 Room611 Research Building MAE

講師：Dr. Rene Pecnik (Associate Professor, Delft University of Technology)

演題：Characterisation and modelling of wall turbulence with strong heat transfer

Turbulent flows with strong heat transfer are common in nature and engineering applications. In general, heat transfer is accompanied with strong temperature gradients and consequently gradients in thermophysical properties. How these gradients affect turbulence has been subject to research for several decades. This talk will outline a novel approach to characterize wall turbulence affected by heat transfer using conservation equations that have been scaled by semi-local quantities. Using direct numerical simulations of heated flows in a channel we show that the semi-locally scaled stress balance equation can be used to derive a universal velocity transformation that is capable of collapsing velocity profiles from variable property flows with incompressible law of the walls. Moreover, if the turbulent kinetic energy equation is derived by semi-locally scaled momentum equations we show how models for LES or RANS can be corrected to yield accurate results.

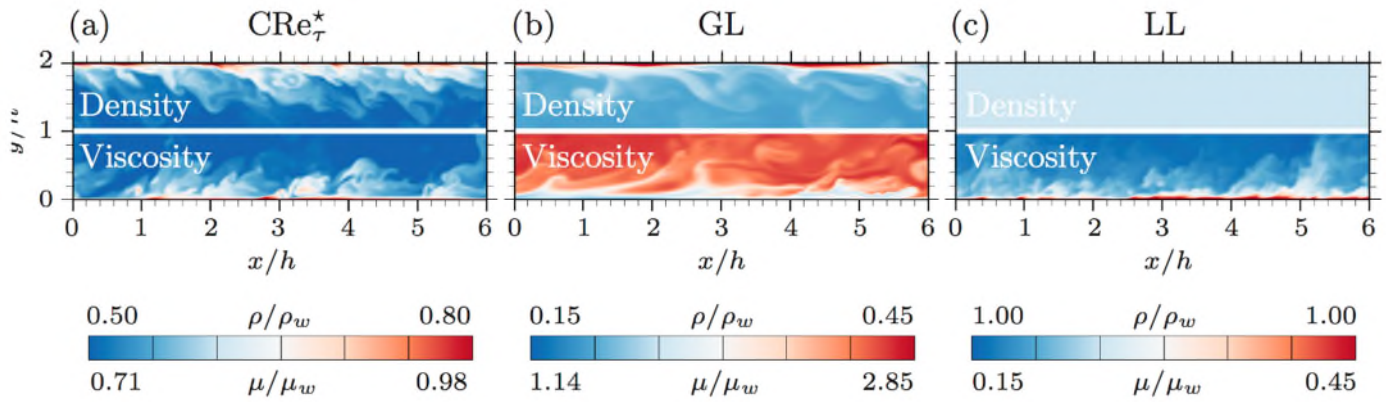

Figure 1: Three different fluids, volumetrically heated inside a turbulent channel flow.

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Bio: In 2007 Rene Pecnik received his doctorate with distinction from Graz University of Technology, Austria. From 2007 to 2010 he was postdoctoral researcher at the Center for Turbulence Research at Stanford University, United States. In 2010 he joined Delft University of Technology as an Assistant Professor and since 2016 he is Associate Professor.

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