

Title Heat transfer in the transitional flow regime

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Abstract

The transitional flow regime where flow suddenly changes with a discontinuity from the laminar to turbulent flow regime has always been experienced by scientists and engineers as a “strange phenomenon”. No simple theory or model is available that satisfactorily explains this and experiments cannot very accurately measure the sudden changes. Advances have been made with numerical simulations but only if small time steps are used which is very expensive. The focus of this talk is not the development of a new turbulence model. It is to show and discuss accurate experiments that were taken in the transitional flow regime. The experiments are heat transfer and pressure drop measurements with different types of inlets. The inlets were a squared-edge, re-entrant, bell-mouth and fully developed hydrodynamically entrant. The tubes were smooth tubes, enhanced tubes, and micro channels. The fluids that were considered were water, glycol and nanofluids.

About the Speaker

Prof. Meyer obtained his PhD in mechanical engineering at the University of Pretoria. Before accepting a position as Professor and Head of Department at the same university he was a lecturer and/or professor at the Military Academy at the University of Stellenbosch, North-West University and the University of Johannesburg. He has published more than 450 papers and his research focuses on heat transfer with specific reference to heat exchangers used in industry with applications from air conditioning to the chemical industry and to the generation and power using solar, nuclear or fossil fuels. According to the latest Essential Science Indicators of the ISI Web of Knowledge, Prof Meyer’s research is ranked based on citations amongst the top 1% of the world in the field of engineering. He is/was the editor, lead editor or associate editor of various prominent international heat transfer journals. He has also received three teaching awards as Lecturer of the Year from two different universities as well as four Exceptional Achiever awards from the University of Pretoria. He has also recently received an international award as Best Professor in Mechanical and Aeronautical Engineering from the World Council of Education.

Host: Professor Yasuyuki Takata

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