S11 - Turbocharging systems

Organizers: Hua Chen & Hideaki Tamaki

This session focuses on recent research and development on Turbochargers and Turbocharging. Turbocharging has enabled internal combustion engine to meet emission requirements and improve efficiency and power density of the engine for decades. Now facing the challenges posed by recent and future emission regulations and market trends, more reliable turbocharging systems with higher efficiency are mandatory. Also, as power trains are becoming more diversified, various air management and waste-heat recovery systems based on turbomachinery are needed and under development. The session will address the new challenges facing the industry and discuss new ideas and share experiences.

Non-exhaustive list of suggested topics

- Effects of future legislations on air management systems and future needs of the systems;
- New and novel ideas of turbocharging and turbochargers;
- Turbocharger reliability;
- Turbocharger aerodynamics;
- Bearings, vibrations and acoustics of turbochargers;
- New manufacturing technologies of turbochargers;
- New applications of turbocharging technologies (air propulsion, fuel cell, hybrid power trains etc.)
- Microturbine systems;
- Waste heat recovery turbines and related air managements components;
- Mechatronics and control for turbocharger and other air management systems;
- Simulation and testing techniques.

Organizers

Dr Hua Chen is a Professor of Mechanical Engineering at Dalian Maritime University in Dalian, China, since January 2017. He was Technical Director of National Laboratory of Engine Turbocharging Technology at Tianjin, China, for four years between 2013 and 2016. He obtained his BSc degree and MSc degree in China in early 1980s. He studied turbocharger turbine at UMIST, England between 1987 to 1990 and obtained his PhD degree. In UK he first worked at Imperial College and later jointed Honeywell Turbo Technologies. He was a Senior Principal engineer, manager, and standard executive of Honeywell, and received several awards from Honeywell for his engineering work. He was a Distinguished Visiting Fellowship of Royal Society of Engineering, UK in 2015. Dr Chen's research interest is on aerodynamics of radial turbomachinery. He has published more than 60 papers at peer reviewed conferences and journals, held more than 10 US and EU patents and several Chinese ones.

Dr Hideaki Tamaki is a Senior Technical Advisor of Technology and Intelligence Integration at IHI. He is also teaching aerodynamics of turbomachinery and fluid mechanics as a part-time instructor at a few universities. Dr Tamaki obtained his Bachelor degree and Master of Engineering at Tokyo Institute of Technology in Japan. He joined Ishikawajima-Harima Heavy Industries (predecessor of IHI) in 1984. Since then he has been engaging aerodynamic design of radial turbomachines, in particular centrifugal compressors for various applications including turbochargers. He obtained his doctoral degree of engineering at Tokyo Institute of Technology in 2000. He has published many papers at conferences and journals, held 8 US patents. He received ASME ASIA 1997 Best Paper Award and 2012 ASME IGTI Best Technical Paper Award.

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