S16 – Design and optimization of turbomachines

Organizers: Dr. Hiroyoshi Watanabe & Mr. Satoshi Kawasaki

Computer aided optimization (CAO) have been applied to the design of all kinds of aerodynamic, hydrodynamic parts of turbomachinery such as compressors, pumps, hydro turbines and so on. Recent progress of computer technologies and developments of simulation software includes single and multi-objective optimization of single area (performance for example), interdisciplinary (or Multi-disciplinary) optimization approaches considering plural objectives such as aero/hydro performance, mechanical reliability, operational stability, costs of production etc. The use of new optimization approaches such as adjoint method, topological optimization has also significantly increased in the last decade. These approaches should become more and more important in the future to undertake further challenges and to produce "breakthrough" design featuring high performance and high reliability with compact size etc.

The **Design and optimization of turbomachines** session of ISROMAC 18 aims at providing opportunity to present and discuss recent researches about optimization methods and experimental validation of these methods, and their application to design of turbomachinery. Any topics related to design and optimization of turbomachines are welcomed.

Non-exhaustive list of suggested topics

- Gradient-free and black-box optimization methods
- Gradient-based and adjoint optimization methods
- Multi-disciplinary optimization
- Multi-fidelity optimization
- Surrogate model-based optimization
- Optimization under uncertainty
- Applications in the academic and industrial setting
- Experimental validation of optimal configurations
- Systems engineering, upstream design
- Quality engineering

Organizers

Dr. Hiroyoshi Watanabe is a General Manager at Technology Development Department, Strategy & Technology Management Division, Fluid Machinery & Systems Company, Ebara Corporation, Japan. He received his B.S. and M.S. degrees from KEIO University, and Dr. Eng. from University of Kyushu, Institute of Technology, Japan. He is now in charge of the development and application of fundamental technologies for fluid machinery at Ebara Corporation

Satoshi Kawasaki is working as a Researcher at the Japan Aerospace Exploration Agency (JAXA). He worked on design and development of rocket engine turbopumps at IHI Corporation (Japan). His research interests include fluid dynamics, rotor dynamics, cavitation and design engineering of turbomachinery.

Contacts

watanabe.hiroyoshi@ebara.com

kawasaki.satoshi@jaxa.jp