

PREFACE: 7th INTERNATIONAL AND 45th NATIONAL FLUID MECHANICS AND FLUID POWER CONFERENCE

This special issue carries papers by authors who participated and presented their research work at the 7th International and 45th National Fluid Mechanics and Fluid Power Conference held at IIT Bombay in India from December 10–12, 2018.

Among the large number of papers received in the form of extended abstracts, a few were selected by the editors of the special issue on the basis of the content of flow visualization (both experimental and numerical), choice of research problem, and their likely impact in the scientific community. Selected authors were later invited to submit a full-length article for the special issue. Out of 28 invited articles, we received 25 fresh manuscripts by the submission deadline of June 2019. These articles were individually reviewed by two to three experts, returned for revision, and followed by final acceptance. After a rigorous review process, the special issue now contains a total of 21 fruitful articles, which will appear at various points of time in the present year.

Accepted articles in this special issue cover considerable ground related to state-of-the-art flow visualization techniques, image processing, data analysis and interpretation, and breakthrough results that help in advancing our knowledge of complex thermo-fluidic systems often encountered in practice. A few of the articles sensitize readers to the fundamental principles that govern measurement. Others provide deeper understanding and an in-depth analysis of the physics associated with challenging flow configurations. Advanced imaging approaches such as time and space-resolved flow measurements, interfacial phenomena, high-resolution imaging that seamlessly threads large-scales and small-scale flow patterns, and use of soft computing tools are visible in this issue.

The articles included here emphasize new developments in measurement sciences based on imaging. Flow visualization, when combined with robust data reduction methodology and efficient image analysis algorithms, can quantitatively map the cross-sections of the physical process with remarkable resolution in space and time. Overall, this special issue indicates new directions that will be adopted by researchers using visualization tools for applications in fluid flow and transport phenomena.

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