

Experimental Methods and Laboratory Instrumentation in Hydraulics

PREFACE

The recent development of equipment and software for hydraulic measurements, data analysis, and visualization, has introduced new opportunities but also new challenges for research and technical cadre.

The advanced methods and techniques are significantly contributing to a more comprehensive approach in analyzing research problems, enabling testing new theories and adding new study possibilities. Such advancements are particularly important for experimental studies which rely on good data quality and reliable methodology. The set-up of new equipment often requires the development of custom solutions, acquisition of new skills and experience to be able to interpret the data. In the multitude of available equipment, laboratory setups, and techniques, it is necessary to exchange knowledge and experience to identify the best solutions to solve challenging research problems. This information is rarely covered in scientific communication. Thus, this webinar was designed to serve as a platform for academics, technicians, and practitioners from the industry to share their experience in modern hydraulic experimental approaches. Presentations were then specifically chosen to tackle state-of-the-art and well-established methods employed for measuring e.g. the water velocity, density, particle tracking, quantification of acting forces in water, numerical description of bed geometry.

The main aim of this webinar was therefore to bring together young and experienced researchers, who are often pioneers in implementing some methods, and specialists from the industry. The former group is also connected with IAHR Young Professionals Network, which gathers both students and scientists and is a part of this webinar. We believe the participation of young people is especially important to foster their professional development, to help them in seeking the newest, most optimal methods for their investigations and to build a community of future specialists. This would not be possible without the participation of experienced researchers and practitioners who often operate with top-grade equipment. We hope that the webinar will spark a meaningful discussion, initiate new ideas and promote collaboration between participants in the near future.

The present work is summarizing the outcomes of a webinar on Experimental Methods and Laboratory Instrumentations in Hydraulics, co-organized by the Institute of Geophysics of the Polish Academy of Sciences, the IAHR Committee on Experimental Methods and Instrumentation and the IAHR Poland Young Professional Network. During the webinar, six keynote lectures will combine with three speeches from industry representatives and 27 technical contributions, mainly coming from young researchers.

In terms of the geographical distribution of the abstracts, around 15 countries are represented, showing the importance of the topic in the actual literature, and the willingness for developing international and transdisciplinary connections.

We would like to acknowledge the contribution of the Scientific Committee, which helped us in judging the abstracts, suggesting changes and future directions that, hopefully, can contribute to new outcomes and in filling gaps in the understanding of fluid dynamics at the laboratory scale.

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