



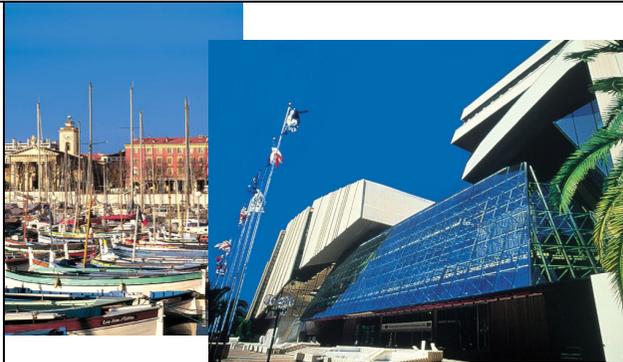
198th session of Comité Scientifique et Technique de la Société Hydrotechnique de France

SIMHYDRO 2010

Hydraulic modeling and uncertainties

June 2nd, 3rd & 4th 2010
Nice-France

www.simhydro.org



CALL FOR PAPERS

Modeling in fluid mechanics, hydraulics, and hydrology, whether using digital tools or using scale models, has reached sufficient maturity to be in daily use by engineers for analysis and for communication. Increasingly complex cases can be handled thanks to ever more sophisticated tools and increasingly abundant computing power. However, quantifying uncertainty in the data and in the models for integration into decision-making processes remains a legitimate concern. With respect to these issues, a number of questions remain open: the calibration and accuracy of complex models, their relevance to case studies, and their prediction capability

Organizing committee:

G. Caignaert, J. Cunge, Ph. Gourbesville (*chair of committee*), N. Goutal, D. Laurence, D. Roult, P. Sauvaget, N. Sheibani, P.L. Viollet

The organizing committee invites prospective authors to submit abstracts of papers for presentation at one of the sessions.

The **June 3rd** session is intended to foster dialog among all participants through several round-tables. Proposals for brief feedback on true projects and recounting incidents and solutions are encouraged. The organizing committee invites authors to submit abstracts for presentation at one of the sessions.

For detailed instructions, see www.simhydro.org

Conference languages: English / French with simultaneous translation

Deadlines:

- Abstract submission: **15 October 2009**
- Wish to take part in round tables: **15 October 2009**
- Notification of acceptance: **30 November 2009**
- Full paper submission: **28 February 2010**

Information on conference venue:

<http://www.polytech.unice.fr/page51.html>

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June 2nd, 2010

Hydraulic engineering, water management, and modeling

Do models ensure reliable results or rather, are results subject to uncertainty? What are the sources of uncertainty: choice of tools? Uncertainty and error inherent to the methodology? To the data? To calibration? To the skills of users? And above all, how to determine the range of uncertainty? What sensitivity studies are useful for model calibration and for determining the range of uncertainty?

Simulation:

- Choice of model as a function of the goals of the study and the data (1D, 2D, 3D, scale models)
- Multi-scale and multi-domain modeling
- Complementarities between different models, joint use of models

Uncertainty:

- Power of prediction of calibrated models and integration of new data. Model calibration or validation of results
- Uncertainty of modeling to simulate future issues and their impacts (feasibility studies, business)
- Quantification and ranking of sources of uncertainty, dependence of sensitivity of results upon relevant parameters
- Determining the range of uncertainty in results

June 3rd, 2010

Stakeholders and models, hydroinformatics

One group of stakeholders are users of the results of modeling: decision-makers such as elected representatives, NGOs, investors, governments, local and central, and in general, citizens. Another group are those who run the models themselves, e.g. engineers carrying out feasibility studies, businesses, water-related service and utilities managers. With the help of models, can all the stakeholders understand each other? Do they use hydroinformatics technology? Do they have the means to dialog directly or indirectly with the model developers? Do the developers and researchers on the one hand, and the stakeholders on the other, know each other well enough to exchange information and clearly express concerns about the limits and the potential of the models?

Engineering applications:

Role of hydroinformatics:

- Decision-making: impact studies, use of models and uncertainty in the results
- Implementation and application, participation of stakeholders in construction works monitoring and follow-up: project conformance with original requirements and QA standards

Communication between players (technical, government, elected representatives, NGOs, etc.):

- role of models, power of prediction, uncertainty in results
- use of modeling results, engineering ethics
- stakeholder and modeler: relationship, understanding, confidence, communication of mutual points of view

June 4th, 2010

Numerical fluid mechanics and modeling

What is the state-of-the-art in research and development in the domain of numerical fluid mechanics? What numerical problems are only poorly solved or unsolved for more and more complex approaches such as: the links between hydrodynamics, turbulent diffusion, transport phenomena? What is the state-of-the-art in multi-scale modeling and multi-physics modeling?

Coupling modeling and uncertainty:

- Multi-scale problems and multi-model simulations (nested computations, coupling between models and methods)
- Sensitivity and stability studies by parameterized computation following an experimental protocol Monte Carlo or more sophisticated methods on unreliable input data)
- Boundary-value problems, the existence of solutions
- Sensitivity of algorithms to errors, propagation of errors. Sensitivity to parameters and probabilistic methods
- Validation strategies, establishing reliability-range of models and best-practice guidelines
- Pathologic cases, limits to modeling and practical applications