

Forward

The 4th International Conference on Sensitivity Analysis of Model Output (SAMO 2004) was held in Santa Fe, New Mexico, USA, March 8-11, 2004. This was the first time that the SAMO meeting had been held in the United States of America. The meeting took place in the Inn at Loretto, which proved to be a wonderful venue for holding a relaxed meeting.

The first International Symposium on Sensitivity Analysis of Model Output (SAMO) was held in 1995 in Belgirate, Italy, under the auspices of the Joint Research Centre (JRC) of the European Commission. It was organized by Andrea Saltelli, who brought together a small, informal group of researchers dedicated to the advancement of methodologies for understanding uncertainty in mathematical simulations (models) of physical systems. The same group organized a second meeting in 1998 at the University Ca' Foscari in Venice. The third SAMO meeting was held in 2001 in Madrid, Spain. It was organized by a group from Spain's Department of Environmental Impact of Energy (DIAE) of CIEMAT, together with two universities, Politechnical University of Madrid (UPM) and the University Rey Juan Carlos (URJC).

The theme of the SAMO series has been the study of the variation in the output of a model caused by variations in its inputs variables, parameters, and factors related to numerical solution methods. Especially highlighted at this meeting was the importance of the quantification of the total uncertainty in model prediction. The following techniques were discussed:

- Innovative methods of sensitivity and uncertainty-importance analysis
- Designs and sampling plans for computer experiments
- Model calibration
- Model evaluation and validation
- Reliability analysis and robustness analysis
- Probabilistic and non-probabilistic analysis of uncertainty and sensitivity
- Modeling knowledge and judgment
- Decision-making under uncertainty

The application areas included economics, engineering, environment, nuclear safety, and physics.

The Organizing Committee was comprised of Scott Doebbling, Ken Hanson, François Hemez, Rudy Henninger, Michael McKay, and Kathie Womack, all from the Los Alamos National Laboratory. Kathie Womack's diligent attention to the organizational details contributed greatly to the smooth functioning of the meeting. Vivian Romero of the Statistical Sciences group developed and maintained the SAMO 2004 web site.

To compose the final program, the Organization Committee relied heavily on the recommendations from the Scientific Committee, which included the following people:

- James Cavendish, Research and Development Center, General Motors Corporation, U.S.A.
- Kenneth M. Hanson (committee chair), Continuum Dynamics, Los Alamos National Laboratory, U.S.A.
- Toshimitsu Homma, Department of Reactor Safety Research, Japan Atomic Energy Research Institute, Japan
- Michiel Jansen, Biometris, Wageningen University and Research Centre, The Netherlands
- Hyoung-Man Kim, Structural Dynamics, The Boeing Company, U.S.A.
- Jack P.C. Kleijnen, Department of Information Management, Center for Economic Research, Tilburg University, The Netherlands
- Pedro Padro Herrero, Department of Environmental Impact of Energy, Research Centre for Energy, Environment and Technology, Spain
- Stefano Tarantola, Institute for the Protection and Security of the Citizen, Joint Research Centre of the European Commission, Italy

This committee was tasked with reviewing the 78 abstracts that were submitted for consideration.

The final program consisted of 35 oral presentations, including eight invited tutorials. In addition, 24 posters were presented. By avoiding parallel tracks, it was possible for everyone to hear everything and to provide ample time for questions and comments throughout the four-day conference. There were numerous lively discussions. Additionally, an hour-long open discussion was held on Model Calibration and Validation, with Michiel Jansen, Michael McKay, Anthony O'Hagan, and Timothy Trucano as panelists and Ken Hanson as moderator.

Tutorials were presented on the basic elements of sensitivity analysis by the well-known experts Max Morris, Andrea Saltelli, Michael McKay, Anthony O'Hagan, Katherine Campbell, Timothy Trucano, Roger Cooke, and Jon Helton.

SAMO 2004 drew to Santa Fe 106 registrants from 13 countries. Attendees had ample opportunity for informal technical discussions. Evenings were spent socializing and exploring the unique attractions of Santa Fe. The banquet was held at the Inn at Loretto. Guest speaker Andrew White, of the Los Alamos Computing Project, spoke about the development of computing at LANL in a talk entitled "A History of Predicting the Future."

The conference was generously supported by the Los Alamos National Laboratory (LANL). LANL, which is operated by the University of California for the National Nuclear Security Administration of the U. S. Department of Energy. LANL's contribution facilitated the participation of numerous internationally recognized leaders in the fields of sensitivity analysis and simulation science, many of whom presented the invited tutorials. LANL's sponsorship made it possible for many graduate students to attend. The specific organizations at LANL that provided substantial financial and logistic support include the Weapons Response group (ESA-WR), the Continuum Dynamics group (CCS-2), the Statistical

Sciences group (D-1), and the Research Library. Additional sponsors include the Joint Research Centre of the European Union, the American Statistical Association, and the Society for Industrial and Applied Mathematics.

The SAMO 2004 proceedings include 50 contributed papers. This collection is archived on the web by the LANL Research Library at <http://library.lanl.gov/>. Mark Martinez, of the Library-Without-Walls team, helped create our web pages, and maintain the archive. The conference web pages, which include photos taken during the conference, are maintained by the Statistical Sciences Group at <http://www.stat.lanl.gov/SAMO2004/>.

We suggest that citations to papers from these proceedings include the following information: Author list, "Paper Title," *Sensitivity Analysis of Model Output*, K. M. Hanson and F. M. Hemez, eds., pp. page numbers (Los Alamos National Laboratory, Los Alamos, 2005) (<http://library.lanl.gov/ccw/samo2004/>).

Kenneth M. Hanson and François M. Hemez, editors
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