CEES 4373/5373 Water Resources Management
Distinguished Seminar Series
Feb 3 (Monday), 3:00-4:00 pm, National Weather Center 5600

Approaches to Confronting uncertainties in hydrometeorological forecasting

Abstract:

Hydrometeorological forecasts are plagued by various uncertainties, including forcing inputs, initial/boundary conditions, model structure and model parameters, and model outputs. For those forecasts to be useful to the society, those uncertainties must be quantified and/or reduced. In this lecture, I will discuss the properties of different uncertainties in hydrometeorological forecasting and the various ways to confront them. Depending on their sources, uncertainties manifest themselves differently and require different methodological approaches to characterize them. I will introduce the state-of-the-art methods for dealing with input/output uncertainty, initial/boundary condition uncertainty, and model structure/model parameter uncertainty. Plenty of examples will be used to illustrate uncertainty concepts and the methods in dealing with them. The lecture will end with a perspective on challenges and future directions

Dr. Qingyun Duan
Chair Professor
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Dr. Qingyun Duan is currently a Chair Professor in College of Hydrology & Water Resources at Hohai University in China. His research interests include hydrology and water resources, hydrological model development and calibration, hydrometeorological ensemble forecasting, and uncertainty quantification for large complex system models. Dr. He has authored or co-authored more than 170 peer reviewed articles and edited 4 books. Dr. Duan has been active in many international scientific activities, including serving as the co-leader of the Model Parameter Estimation Experiment (MOPEX) and a member of the scientific steering committees of the Global Energy and Water Exchanges (GEWEX) Project and the Hydrological Ensemble Prediction Experiment (HEPEX). He was or is serving as an editor or editorial board member for numerous scientific journals, including Reviews of Geophysics and Bulleting of American Meteorological Society. Dr. Duan is a Fellow of American Geophysical Union and American Meteorological Society.

Dr. Duan was the original developer of Shuffle-Complex Evolution Global Optimization algorithm, which has been broadly applied in automatic hydrological model parameter calibration in the field of hydrology and water resources management.

Dr. Duan got his Ph.D. and M.S. from the University of Arizona in 1991 and 1987, respectively, and a B.S. focusing on Hydro Power Engineering, from Wuhan University in 1982

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