Karlsruher Institut für Technologie

Seminar@IWU-WB

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Civil & Environmental Engineering

Computational Modeling of Flow and Sediment Transport in Surface Waters

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KIT, Bldg.10.81, Room 305
or online:
https://kit-lecture.zoom-x.de/j/65343526031
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Abstract

Computational modeling of flow and sediment transport in surface waters started from the 1950s. However, due to the constraint of computer speed and capacity, the early models had to be simplified and based on equilibrium transport, single-mode and single-sized approaches. In the last decades, fast advances in computer technology have allowed many of those simplifications to be removed; thus, many multidimensional, non-equilibrium, multiple-sized total-load sediment transport models have been developed for more realistic representation and reliable prediction of complex morphodynamic processes in riverine and coastal waters. This seminar will present several advanced sediment transport modelling approaches, such as non-equilibrium transport, multiple-sized total load transport, multiple-layer bed-material sorting, semi-coupling calculation, and temporal lag of sediment transport. The sediment transport models described are driven by 3-D and depth-averaged 2-D shallow water flow models as well as fully 3-D non-hydrostatic flow models. The models can account for the effects of vegetation and wave breaking on flow and sediment transport

Biography

Dr. Weiming Wu is James K. Edzwald Professor at Clarkson University, USA. He earned PhD from Wuhan University of Hydraulic and Electric Engineering, China in 1991. He was a Research Fellow of A. v. Humboldt Foundation at the University of Karlsruhe, Germany during 1995-1997, and a Research Faculty at the University of Mississippi during 1997-2013. His research focuses on hydraulics and sediment transport. He authored books “Computational River Dynamics” and “Sediment Transport Dynamics”. He received a best paper award in 2007 from World Association for Sedimentation and Erosion Research (WASER), and the ASCE Hunter Rouse Hydraulic Engineering Award in 2026. He is a Fellow of ASCE and IAHR. He served as Associate Editor for International Journal of Sediment Research in 2008-2010 and ASCE Journal of Hydraulic Engineering in 2010-2019. He currently serves as Vice President for WASER.

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