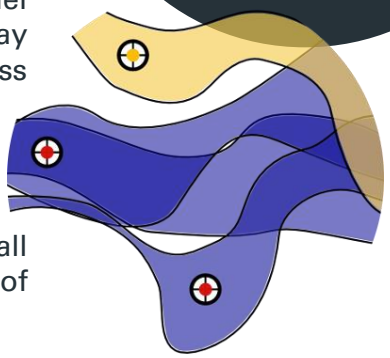
University of Stuttgart
Germany
Department for Stochastic Simulation
and Safety Research for Hydrosystems (LS³)

Uncertainty Quantification for River Model



B.Sc. Topic

Hydro-morphodynamic modelling has been considered as a powerful tool to assess the hydraulic regime and sediment transport processes in open flow systems. River management and river engineering activities (e.g. constructing groynes, lowering the floodplain or dredging the main channel) should be reliable and help to control the transport of water and sediment through a river. However, flow in an open channel represents a complex process, where various physical parameters play a role and where many of them are uncertain, such as roughness coefficients or sediment grain sizes. The prediction of river behaviors vastly depends on our ability to quantify such uncertainties and related risks. In many cases of practical interest, we wish to perform a uncertainty quantification in order to analyze a model as such or to investigate, quantify the effects of parameter uncertainty on the overall model uncertainty. This work will be focused on investigation of uncertainty analysis for a river model.

Prospective Tasks

- Set up a test case scenario for hydro-morphodynamic simulation using a simple river model
- Identify an appropriate automated calibration algorithm that is efficient, robust and can include soft information into the calibration procedure
- Implement and test the identified calibration algorithm on the test scenario

General Information

- Theoretic study
- Cooperation between *Department of Stochastic Simulation and Safety Research for Hydrosystems* and *Department of Hydraulic Engineering and Water Resources Management* at the University of Stuttgart.
- Supervision by Dr.-Ing. Habil. Sergey Oladyshkin, Prof. Dr.-Ing. Wolfgang Nowak and Dipl.-Ing. Felix Beckers

Desireable Skills

- Knowledge of river hydraulics
- Affinity to numerical simulations, statistics and programing (MATLAB)

Apply now!

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