



Updating of a conceptual urban drainage model for online operation

Günther Leonhardt¹, Martin Schöpf², Manfred Kleidorfer³, Kegong Diao⁴,
Wolfgang Rauch⁵

¹ Unit of Environmental Engineering, University of Innsbruck, Innsbruck, Austria,
guenther.leonhardt@uibk.ac.at

² hydro-IT GmbH, Innsbruck, Austria, schoepf@hydro-it.com

³ Unit of Environmental Engineering, University of Innsbruck, Innsbruck, Austria,
manfred.kleidorfer@uibk.ac.at

⁴ Unit of Environmental Engineering, University of Innsbruck, Innsbruck, Austria, kegong.diao@uibk.ac.at

⁵ Unit of Environmental Engineering, University of Innsbruck, Innsbruck, Austria, wolfgang.rauch@uibk.ac.at

ABSTRACT

In contrast to offline model applications, uncertainty analysis and updating of online models is rarely applied in urban drainage. This paper presents a methodology to update a lumped conceptual model during online operation. The purpose of the model is to simulate CSO emissions in real time. Parameters of the rainfall runoff model are updated based on water level measurements in the CSO structure. Although updating of model states is more common, in particular for complex hydrological models, model parameters can instead be updated if a lumped conceptual model is used. Consequently, parameters are not constant but variable in time, or rather depending on the information available. The methodology is based on Monte Carlo (MC) simulations and the GLUE-methodology for Bayesian updating of parameter distributions. Thus, also uncertainty bands of model results are provided in real time. The methodology is evaluated on a small case study. First results proof the suitability of the method and show advantages in contrast to forward error estimation based on MC simulations.

KEYWORDS

online model, updating, uncertainty, CSO