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Calibration of a Model for better prediction of Flood using Fourier Transform

Master thesis

By

Muhammed Mahfuzul Hafiz Chowdhury

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Program: Master of Science in Water Resource Engineering and Management

Examiner: Prof. Dr. med. rer. Dr.-Ing. András Bárdossy

Supervisor: Mr. Faizan Anwar, M.Sc.

Institute for Water and Environmental Systems Modeling (IWS)

Department of Hydrology and Geohydrology

Pfaffenwaldring 61, D-70569 Stuttgart, Germany

Abstract

A HBV model was calibrated and generated a simulated discharge series which can give good flood prediction. This model was implemented on Necker basin and all the data were collected form four different stations of Necker basin. The model was optimized with the objective function defined as Nash-Sutcliff which is the sum of square difference between the observed and simulated discharge. The model was done using PYTHON programming language. An optimization was done and all the parameters that was used in model was also stored for every Iteration. Using these parameter values the simulated discharge was generated and with the help of Fourier transform these discharge series were transformed to its magnitudes and phases. These Magnitudes and Phases of simulated and observed discharge series were used to determine the covariance. The cumulative covariance corresponding to the annual cycle were taken and plotted against the Nash-Sutcliff values, which was obtained using the parameter values got form optimization. The objective is to select the same NS values but with different covariance values. The discharge series corresponding to the selected NS value was used as simulated discharge series. The high peaks of the graph generally show high amount of discharge generated on that event. Usually the lower covariance values are better for flood prediction.