



## **Hydrological model parameters for different applications**

Faizan Anwar and András Bárdossy

University of Stuttgart, Institute for Modelling Hydraulic and Environmental Systems, Dept. of Hydrology and Geohydrology, Stuttgart, Germany (faizan.anwar@iws.uni-stuttgart.de)

Among the large number of possible parameters obtained by using some performance criteria such as Nash-Sutcliffe (NS) or Kling-Gupta (KG), there might be systematic differences.

We demonstrate that various model parameters that produce very similar objective function values behave differently on various time scales e.g. daily, weekly, monthly, seasonal and annual. The different behavior can be detected by coupling the Fourier transform of the simulated and the observed series. The same objective function value can be achieved by a good agreement between high and low frequency components. The model reproduces flood events, better if the high frequencies components are well reproduced. It performs well for the low flows if the low frequency components are in agreement. This property holds for both the calibration and the validation period. An indicator for distinguishing between these behaviors is suggested.

The above methodology can help to find model parameters for a given application and to reduce the corresponding uncertainties. Examples from the Neckar catchment, Baden-Württemberg, Germany are used to illustrate the methodology.