Assessment of three optimization techniques for calibration of watershed model

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Abstract

In this study, three optimization techniques efficiency is assessed for calibration of the GR4J model for streamflow simulation in Selmacheon, Boryeong Dam and Kyeongancheon watersheds located in South Korea. The Penman-Monteith equation is applied to estimate the potential evapotranspiration, model calibration, and validation is carried out using the readily available daily hydro-meteorological data. The Shuffled Complex Evolution-University of Arizona(SCE-UA), Uniform Adaptive Monte Carlo (UAMC), and Coupled Latin Hypercube and Rosenbrock (CLHR) optimization techniques has been used to evaluate the robustness, performance and optimized parameters of the three catchments. The result of the three algorithms performances and optimized parameters are within the recommended ranges in the tested watersheds. The SCE-UA and CLHR outputs are found to be similar both in efficiency and model parameters. However, the UAMC algorithms performances differently in the three tested watersheds.

Keywords : Optimization, GR4J, Model Performance, Parameter

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