Applications of Harmony Search in parameter estimation of probability distribution models for non-homogeneous hydro-meteorological extreme events

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Abstract

In frequency analyses of hydrological data, it is necessary for the interested variables to be homogenous and independent. However, recent evidences have shown that the occurrence of extreme hydro-meteorological events is influenced by large-scale climate variability, and the assumption of homogeneity does not generally hold anymore. Therefore, in order to associate the non-homogenous characteristics of hydro-meteorological variables, we propose the parameter estimation method of probability models using meta-heuristic algorithms, specifically harmony search. All the weather stations in South Korea were employed to demonstrate the performance of the proposed approaches. The results showed that the proposed parameter estimation method using harmony search is a comparativealternative for the probability distribution of the non-homogenous hydro-meteorological variables data

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