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Autocalibration of flood forecasting model using shuffled complex evolution(SCE) method

K. Qaderi (1) , K. Mohammadi (2) , H. R. Eslami(3)

(1) Ph.D student, Tarbiat Modarres University, Tehran, Iran, (kghaderi@modares.ac.ir),

(2) Assistant Professor, Tarbiat Modarres University, Tehran, Iran, (kouroshm@modares.ac.ir / Phone: +98-21-8962990), (3) Research and Development Department, Jamab Consulting Engineers Company, Tehran, Iran (eslami@jamab.com / Phone: +98-21-8969710)

The successful application of a flood forecasting model depends in large measure on how well the model is calibrated. Despite the popularity of this model, it is typically difficult to apply these models without obtaining unique optimal values for their parameters using automatic calibration method. Also the model construction and parameters must be defined with high precision to place reasonable degree of confidence on the estimated parameter values. In this research the watershed flood is forecasted using hydrological and meteorological data. Flood forecasting used in this research is kind of combined catchment's model and consist of two parts: rainfall-runoff model in the basin and Muskingum - Cung routing method in the river. Because the calibration process is difficult and complex, there is a need for robust, effective, efficient and reliable automatic calibration procedure. In addition those procedures must have a high probability of finding the global optimum without trapping in local optimum. Therefore in this research we use shuffled complex evolution method that is a new global optimization strategy designed to be effective and efficient for a broad class of problems. The SCE method combines the strengths of the simplex procedure with the concept of controlled random search, competitive evolution and the newly developed concept of complex shuffling. In this method, search begins with an initial population of point's samples randomly from the feasible space. The population is partitioned into one or more complexes, each containing a fixed number of points. As the search progress, the entire population tends to converge toward the neighborhood of the global optimum, provided the initial population size is sufficiently large. This method is used

for flood forecasting in Gharesou basin and its results have been shown that has good correlation.