Title

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The writers thank the discusser for their interest in the original paper and for giving the writers the opportunity to clarify a few issues raised therein.

The firefly algorithm (FA) was proposed by Yang (2008) to solve continuous optimization problems. Continuous algorithms can be used to solve discrete problems; however, it is recommended to use for that task algorithms that are inherently designed for discrete problems, such as the ant-colony optimization algorithm.

The discussed paper did not apply the storage carryover constraint in the simulation modeling because the simulation periods of the irrigation supply and hydropower production problems were long enough so that there was no need to use the carryover constraint. The carryover constraint is appropriately applied when the simulation period is shorter than 10 years (see, e.g., Aboutalebi et al. 2015a). The discussed paper's irrigation supply problem (Aydoghmoush Reservoir) and hydropower production problem (Karun-4 Reservoir) had simulation periods equal to 10 years (120 months) and 42 years (504 months), respectively.

The discussed paper set the value of the tailwater to be constant in the hydropower generation problem because fluctuations of the tailwater are negligible compared with changes in hydraulic head (Aboutalebi et al. 2015b).

The discussed paper evaluated the performance of the FA in solving reservoir operation problems with two different purposes. The standard form of the FA was used for this purpose. The choice of the standard FA is thoroughly addressed in the paper by Garousi-Nejad et al. (2016).

The role of penalty functions is to modify the objective function so that the decision variables take values within the feasible range, that is, constraints are not violated. Therefore, the penalty functions adds a positive (or negative) value to the objective function in minimization (or maximization) problems. This was done in the discussed paper.

The reason to use evolutionary and metaheuristic algorithms (FA in the discussed paper) in problems that can be solved with classic methods (such as linear programming, nonlinear programming, or dynamic programming) is to evaluate the performance of the algorithms and to compare the results with those obtained via the classic methods. This approach has been discussed at length in other papers (see Aboutalebi and Garousi-Nejad 2015).

Independent runs of an evolutionary or metaheuristic algorithm are necessary because these algorithms start with a randomly generated population that changes from one run to another. Multiple runs allow the characterization of near-optimal solutions in terms of averages and standard deviations. The discussed paper applied five runs to generate a range of results. Considering a larger number of runs (say 10, 25, or 100) depends on the problem complexity (Aboutalebi et al. 2015a). The discussed paper established that five runs provided a suitable characterization of the variability of inter-run results.

The number of functional evaluations has been used in several studies (Aboutalebi et al 2016a, b) because it is more informative than computational time or number of iterations of an optimization algorithm. In fact, the number of functional evaluations is independent of the computing equipment and thus provides a fairer comparison. The number of functional evaluations is calculated by multiplying the population size by number of algorithmic iterations.

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