

Response to comments of Anonymous Referee

We would like to thank Dr. Pegram for the thoughtful comments and suggestions. The follows are our response in regard to the comments and suggestions.

The paper contains virtually no hydrology but is stuffed with 'mathematicity', some of it over complicated. The 2 figures (there are only 2) display the link between theoretical parameters derived from a linear model, but there is not one figure showing rainfall and the attendant runoff. There is no mention of Dooge, Nash nor Diskin.

Response

a. Both rainfall and runoff are natural phenomena and important parts of hydrological cycle. The quantification or study of the rainfall and runoff provides background information for flood forecasting or control, storm sewer design, water resources management, etc. The rainfall-runoff process is therefore the key issue in the hydrology or surface hydrology. Unfortunately, the estimation or prediction for such a process is subject to a large degree of uncertainty due to its inherent heterogeneity. The main focus of this study is therefore placed on the influence of temporal variability of rainfall models on the runoff discharge process. Our findings will be useful for runoff discharge predictions under field conditions which provide a reliable basis for water resources management.

b. We would like to provide briefly discussions on quantitative relationship between the rainfall and runoff and their uncertainty in Lines 254 of page 13 as

“Quantitation of runoff discharge is the primary information for water resource management and planning in river basins. The quantitation generally involves a prediction over a relative large time scale, where direct measurements are not possible in many field cases. Under such conditions, there will be a great deal of uncertainty in applying the solution of the mean model (or the deterministic model). The temporal distributions of normalized mean runoff discharge (\bar{Q}/\bar{R}) predicted by Eq. (23) and its uncertainty (one standard deviation) estimated based on Eq. (29) shown in Figure 3 indicate that the uncertainty grows as the runoff discharge increases with time.”

c. Two articles by Nash and Dooge have been cited on page 4 (Line 86) as

“Early work on a linear storage parameter of this type was reported by Nash (1959) and Dooge (1959).”

References

Dooge, J. C. I.: A general theory of the unit hydrograph, J. Geophys. Res., 64(2), 241-256, 1959.

Nash, J. E.: Systematic determination of unit hydrograph parameters, J. Geophys. Res., 64(1), 111-115, 1959.

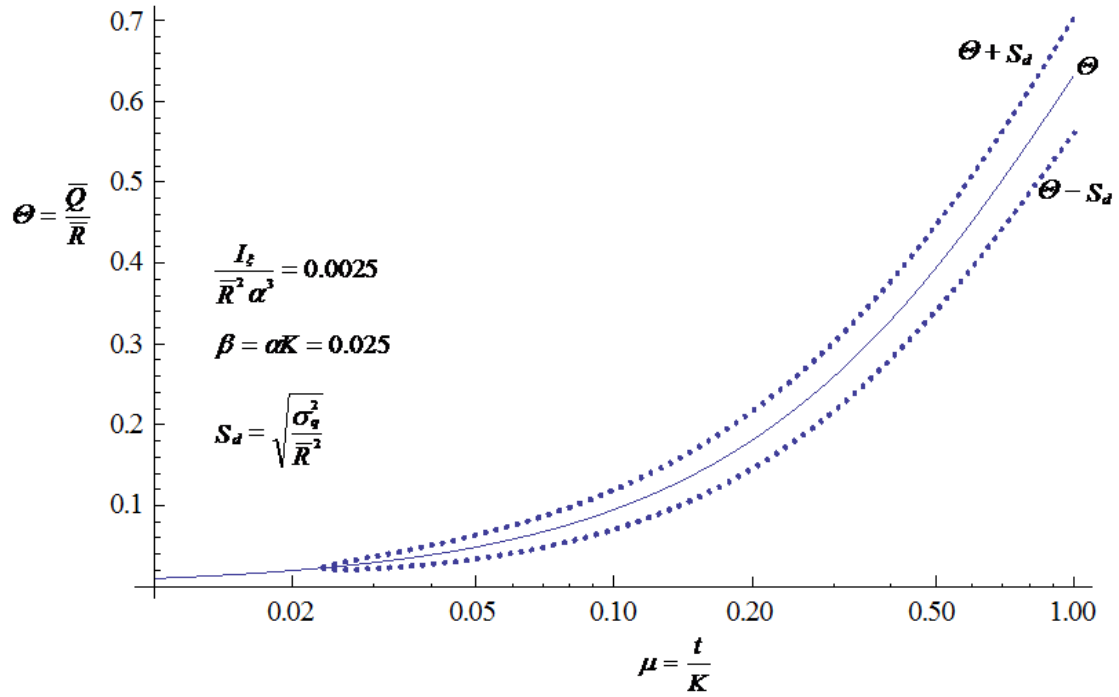


Figure 3. Normalized mean runoff discharge profiles along with one standard deviation intervals as a function of dimensionless time.