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Hydrology and Earth System Sciences Discussions

Interactive comment on "Influence of rainfall observation network on model calibration and application" *by* A. Bárdossy and T. Das

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1 The optimal locations of the rain gauges are defined using the simulated annealing. The objective function of the simulated annealing was to find the locations of particular number of rain gauges those are uniformly located over the catchment. For that the distance between each grid and each statations was minimized.

2 For precipitation interpolation: experimental variogram is calculated for each day when the daily precipitation amount exceeds some threshold values. The average variogram is used in the remaining days. The experimental variogram is fitted with theoretical variogram using automatic fitting procedure. However for smaller network densities, the avearge variogram is used through out the period to avoid numerical instability. For temperature interpolation: the average variogram is used in every day.

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A combination of two theoretical variogram models, the spherical variogram and the pure nugget effect variogram is used.

3 The figure is replaced with new Fig 5. The explanation is added in point # 3 of the Reviewer # 1.

4 Some more information is added in the revised manuscript without giving a great detail.

5 Temporal variability is influencing the hydrograph considerably. However this was not the main interest of this paper - we tried to concentrate on the spatial aspect. A combined space time investigation would of course be of great interest.

6 Table 5 label is modified.

7 The sentence has been rephrased. The coefficients of the multiple liner regression was computed using the data of the complete simulation period (calibration and validation). Then the rainfall data for particular raingauges for the validation period were considered as missing measurements. Those missing values were filled using the derived multiple linear regression coefficients.

8 We are not clear if we understand the question correctly. The model performed well when it was calibrated using precipitation from 20 raingauges and was run with an incomplete observed data set combined with data generated using the multiple linear regression technique at the locations of the remaining 10 raingauges. Regarding modeling of runoff at higher time scales (at a 7 day and 30 day time scale), the model performance in terms of the Nash-Sutcliffe coefficient shows a similar trend as that shown in Fig. 10 at the daily time scale. Nevertheless, the model performance improves at the higher time scales.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 3691, 2006.