

## ***Interactive comment on “Cost-effective rain gauge deployment and rainfall heterogeneity effect on hydrograph simulation in mountainous watersheds” by Jr-Chuan Huang et al.***

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This paper investigates the minimum number of rain gauges needed in order to accurately describe the spatial pattern as input to a discharge model. Both reviewers expressed their major concern with respect to the interpolation technique which is chosen. Thiessen polygons should not be used in areas with large topography differences, but rather techniques that account for the elevation within the interpolation scheme should be used. The authors should definitely reprocess their data and verify whether interpolation schemes that use auxiliary data should be used, and if so, the

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analysis should be repeated. The analysis is also only based on 2 extreme events, which does not show the robustness of the presented results (and its application to less severe storms). I would recommend to the authors to add radar data of several events with less extreme rainfall, on which the same techniques are applied. Reviewer 2 has several important issues which all should be addressed. Many remarks request additional information with respect to the hydrologic model used. Based on the above remarks, and the remarks made by both reviewers, this paper needs to go through a major revision, which will need to present additional analyses.

Reply:

Many thanks for those constructive comments, which expand the applicability of this study and make our contribution more substantial. The evidence is now more robust though the whole story remains similar. Three interpolation techniques, 6 sampling densities and 8 events are used. The abstract was re-written focusing more on hydrograph response to imperfect rainfall. Results are more convincing now. On the other hand, more details about hydrologic model are added in Section 2-4, hydrological model.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2169, 2008.

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