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https://doi.org/10.2151/jmsj.2016-005

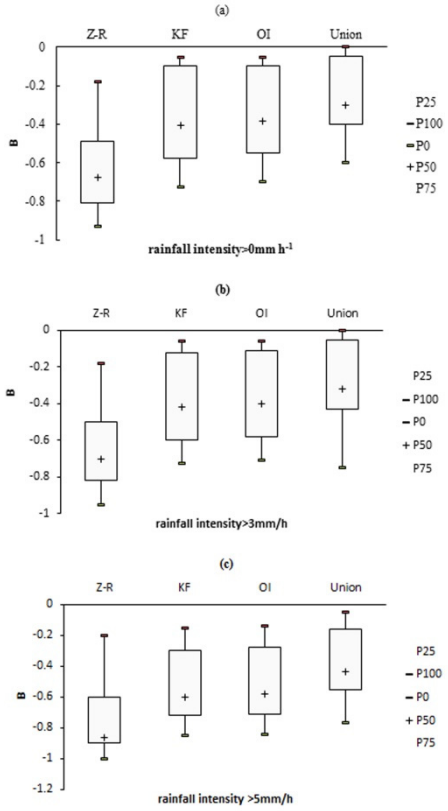

Figure 3 Scatterplot of CINRAD (Z-R, KF, OI and Union) vs. rain gauge hourly accumulated rainfall for the event.

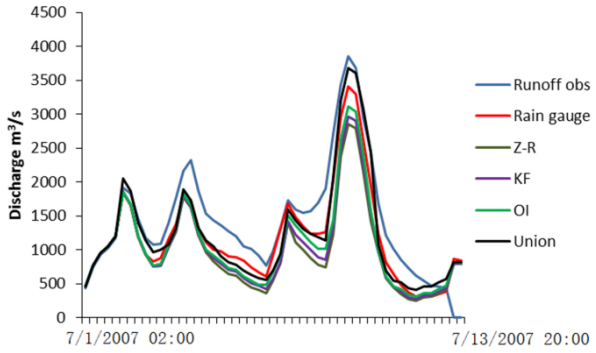

Figure 8 Plotted hydrographs of the simulated runoff for the event with a Computational time step of 1 h at the Xixian outlet. Obs represents the observed runoff discharge, and Obs-simulation denotes the simulated runoff when using rain gauge rainfall.

- The main purpose of this study is to integrate a rainfall estimate by the China New Generation Weather Radar S-band radar (CINRAD-SB) into the Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) and analyze the CINRAD-SB rainfall estimation and its impact on the runoff simulation of this type of rare flood event in a region with complex terrain.
- For the CINRAD-SB rainfall estimation four methods are considered: (1) Z=300R1.4 (Z: radar reflectivity, R: rainfall intensity); (2) a rainfall estimation error adjustment by using a Kalman Filter (KF); (3) Optimal Interpolation (OI); and (4) the Union method, which is composed of KF and OI. The relative bias values of the four methods vary with different rainfall intensity, those of the Union method vary the least among the four methods (Fig. 4).
- Runoff simulations based on radar-rainfall could reproduce similar overall patterns to the observed streamflow. The peak discharge contains obvious improvements – for instance, the skill score is 0.6 – in model runs with forcing that is provided by the Union method vs. rain gauge data (Fig. 8).