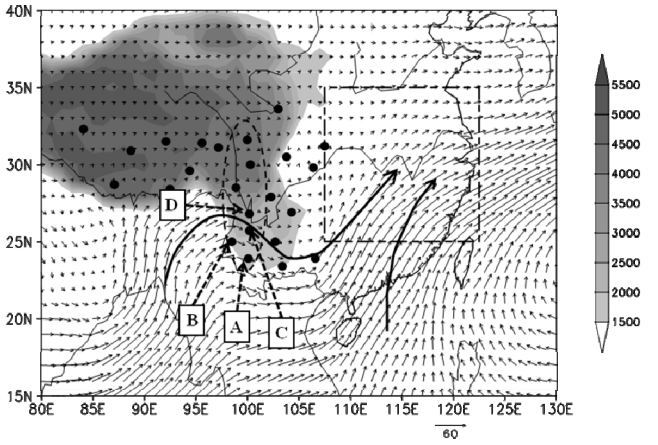
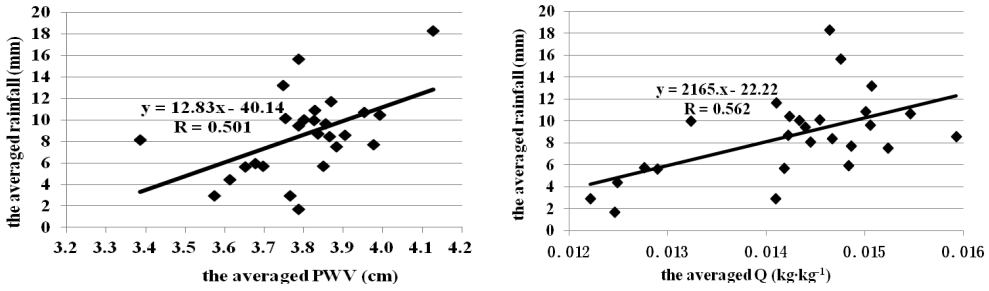
Zhang, S. J., X. Xu, S. Peng, W. Yao, and T. Koike, 2014: Three-dimensional variational data assimilation experiments for a heavy rainfall case in the downstream Yangtze River Valley using Automatic Weather Station and Global Positioning System data in southeastern Tibetan Plateau. *J. Meteor. Soc. Japan*, **92**, 483-500.
http://dx.doi.org/10.2151/jmsj.2014-504



←
Figure 1. Column-integrated water-vapor transport flux (units: kg•m^{-1}•s^{-1}), averaged in the period of 0000UTC 25 June to 0000 UTC 05 July 2009.

↓Figure 2. Scatter diagrams between the averaged PWV (left panels; units: cm) or *q* (right panels; units: kg•kg-1) from three GPS stations and the lagged area-mean rainfall (units: mm) over the target area, with a lagged time of 72 h.



- The relationship between the water vapor in the Tibetan Plateau (TP) region and the summer rainfall in the Yangtze River Valley (YRV) was investigated, focusing on the role of the "key sensitive area (KSA)" in the southeastern edge of the TP in transporting water vapor downstream (Figure 1).
- There existed high correlations between the moisture and precipitable water vapor (PWV) observed by the Automatic Weather Stations (AWS) and Global Positioning System (GPS) stations over the southeastern slope of the TP and the summer rainfall in the YRV (Figure 2), suggesting the former can be used as a good early-warning signal for the occurrence of the latter.
- The assimilation of observations from the AWS and GPS in the KSA helped to adjust the structures of moisture, temperature and wind fields, which improved the rainfall forecast in the YRV, especially the heavy rainfall event. This result suggests that the assimilation of early-warning signals in the KSA into the initial field may help to improve the prediction of rainfall in the YRV, especially for 2-3 day forecast.
- Both data analysis and numerical experiments demonstrated that the observations in the KSA improved the forecast of high-impact weather in the YRV.