

**Atmospheric water vapor transport associated with two rainfall shifts over East China**Zhi Ping Wen<sup>†</sup>; Xiu Zhen Li<sup>†</sup> Sun Yat-sen University, China, People's Republic ofLeading author: [eeswzp@mail.sysu.edu.cn](mailto:eeswzp@mail.sysu.edu.cn)

Atmospheric water vapor transport and moisture budget associated with two rainfall regime shifts in 1978/79 and 1992/93 over East China are analyzed by using the observational precipitation data and the ECMWF ERA-40 reanalysis data. It is found that the summer rainfall over East China experiences two notable shifts over the past few decades. For the first rainfall shifts, the northward water vapor transport over East China weakened. Anomalous anticyclonic moisture circulation associated with decreasing water vapor divergence links to the below-normal precipitation trend over SC. Strengthened eastward water vapor transport and the anomalous southward transport to the north are beneficial to the abrupt increase of rainfall over Yangtze-Huaihe River valley. Less northward water vapor transport results in decreasing rainfall over North China after 1978/79. For the second rainfall shift, it is the convergence of the warmer tropical water vapor from the south with the colder subtropical anomalous water vapor that results in the obvious rainfall shift over Southeast China and Yangtze River basin after 1992/93. The decadal variations of regional moisture budget are also corresponding well with the rainfall shifts. And, it is the meridional water vapor fluxes which play a key role during two rainfall shifts over three regions. The weakened south wind over East Asia on lower level, streams diverge associated with southward drift of westerly jet over Yangtze-Huaihe River valley, convergence of stronger westerly and the south divergent flow over SC on upper level are the chief circulation anomaly patterns that lead to the anomalous water vapor transport associated with the first rainfall shift. The abnormal northeastward wind and the southwestward wind associated with two anticyclone anomaly to the south and to the north, converge over Southeast China. Hence, the lower convergence, mid-level ascending motion, and upper divergence benefit the increasing rainfall over Southeast China and Yangtze River basin after 1992/93.