Geophysical Research Abstracts
Vol. 20, EGU2018-315, 2018
EGU General Assembly 2018

Some advances of water vapor research in Xinjiang

lianmei Yang (1) and jing Liu (2)

(1) Center for Asia Atmosphere Science Research , Central Asia weather and climate department , Urumqi,China (532860459@qq.com), (2) Center for Asia Atmosphere Science Research , Central Asia weather and climate department , Urumqi,China (994365768@qq.com)

The main study progress on water vapor in Xinjiang are summarized since 1960s. The results show that the major vapor comes from the Caspian Sea [U+FF0C] the Black Sea [U+FF0C] Mediterranean [U+FF0C] the North Atlantic and the Arctic sea to the west side of Xinjiang. The Caspian Sea and Mediterranean are the sources in winter and spring, the North Atlantic and the Arctic sea in summer [U+FF0C] and the Black Sea and Caspian Sea in Autumn [U+FF0C] respectively [U+FF0E] During the seasons with abundant precipitation, more water vapor transportation along westerly over middle Asia comes from Arctic Ocean and sub-tropical/tropical zone [U+FF0C] but mainly from the sub-tropical/tropical water vapor transportation. It exits water vapor transportation anomaly from tropical India Ocean/ mid-high to the mid-Asia and Xinjiang during the summer/winter rainfall interdecadal increasing after 1987. At the meantime, the intensified and westward East Asian Pacific teleconnection(EAP) along the East Asian coast made great contribution to the increase of Xinxiang summer rainfall. The mainly pathways of water vapor transport related to heavy rainfall processes are the water vapor from the west along westerly, the south from Tibetan Plateau and the east by LLEJ from Baikal Lake, but the mainly water vapor comes from the westerly and sub-tropical/tropical southwesterly. Water vapor during the short-time strong rainfall fastly comes from the local water vapor convergence. Some problems remaining to be resolved are pointed out as follows: there have insufficient understanding about the impact of climate change on atmospheric water circulation system in Xinjiang and it's the physical process, the study on the water vapor source/sink structure of rainstorm/snowstorm, relay transmission mechanism, the main water vapor source and the multi-scale pathway's contribution on the rate of precipitation by applying the numerical model, the trajectory analysis method in Xinjiang region was not enough. The application of multiple detection means of water vapor, such as satellite, Doppler weather radar, GPS/met moisture detector and microwave radiometer, is weak in monitoring and early warning of strong convective weather in Xinjiang. To solve the above-mentioned problems, it is very important for improving the weather forecast development in Xinjiang, the accuracy of strong convective forecasting and warning and the sustainable utilization of water resources.
Keyword: Xinjiang; Different time scales; Strong precipitation process; Water vapor source; Water vapor transmission;