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## Atmospheric hydrological budget with its effects over Tibetan Plateau

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Based on 1961-2000 NCEP/NCAR monthly mean reanalysis datasets, vapor transfer and hydrological budget over the Tibetan Plateau are investigated. The Plateau is a vapor sink all the year round. In summer, vapor is convergent in lower levels (from surface to 500 hPa) and divergent in upper levels (from 400 to 300 hPa), with 450 hPa referred to as level of non-divergence. Two levels have different hydrologic budget signatures: the budget is negative at the upper levels from February to November, i.e., vapor transfers from the upper levels over the plateau; as to the lower, the negative (positive) budget occurs during the winter (summer) half year. Evidence also indicates that Tibetan Plateau is a "vapor transition belt", vapor from the south and the west is transferred from lower to upper levels there in summer, which will affect surrounding regions, including eastern China, especially, the middle and lower reaches of the Yangtze. Vapor transfer exerts significant influence on precipitation in summertime months. Vapor transferred from the upper layers helps humidify eastern China, with coefficient -0.3 of the upper budget to the precipitation over the middle and lower reaches of the Yangtze (MLRY); also, vapor transferred from east side (27.5o-32.5oN) of the upper level has remarkable relationship with precipitation, the coefficient being 0.41. The convergence of the lower level vapor has great effects on the local precipitation over the plateau, with coefficient reaching 0.44, and the vapor passage affects the advance and retreat of the rainbelt. In general, atmospheric hydrologic budget and vapor transfer over the plateau have noticeable effects on precipitation of the target region as well as the ambient areas.

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**关键词:** Tibetan Plateau; atmospheric hydrologic budget; vapor transfer; rainfall doi: 10.1360/gs/040110