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Diagnosis and analysis on the evaporation paradox in the Jinsha River basin, China

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Evaporation paradox has been received attention worldwide, and was universally recognized, but the specific causation still remains uncertain. As the most crucial water-energy source of the Yangtze River basin with significant elevation difference, Jinsha River basin was selected as the case study. The relationship between evapotranspiration and air temperature in the upstream, midstream and downstream with decreasing altitude in the study area was investigated in this paper. As a result, evaporation paradox was observed at midstream and downstream. In order to further explore the causation, wind speed, relative humidity, solar radiation were combined to figure their effects on evaporation. Results showed that both relative humidity and wind speed were closely linked to evaporation at midstream and downstream, and no obvious relationship was found between the evaporation and air temperature in upstream, the relationship between wind speed, relative humidity and evaporation was quite weak, but the effect of air temperature and solar radiation on evaporation was of great significance. The discrepancy in the derivation of evaporation and the abundance of water vapor from upstream to midstream and then downstream induced by elevation difference was considered as the direct factor for this phenomenon. The findings could provide a reference for similar studies in the future.