

Interactive comment on “Shift of annual water balance in the Budyko space for a catchment with groundwater dependent evapotranspiration” by X.-S. Wang and Y. Zhou

X.-S. Wang and Y. Zhou

wxsh@cugb.edu.cn

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Thanks a lot for the constructive comments proposed by the Reviewer #3. The comments will be considered in revise the manuscript.

We are aware of the misleading sentence “This hypothesis is robust for long-term mean annual water balance but is dubious for the inter-annual variations in catchment with varying dryness”. It will be revised on the basis of correct understanding on the validation of the Budyko hypothesis in specified conditions.

It is necessary to confirm that we did not have the “observation” data of annual ET in

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the studied catchment. As well, the “REAL” ET could not be obtained from $ET=P-Q$ for the annual patterns because the change in storage is not ignorable in the annual water balance behavior in the catchment. This is the reason for using a monthly hydrological model in estimating the annual ET. As a result, we could not inverse the model with “observed” ET data but just with the observed streamflow data and identified base flow data.

The total ET rate in the catchment is an area-weighted summation of separated ET in the zone-1 and zone-2, calculated from $E1m$ and $E2m$, in Eq. (17), respectively. Among them, $E1m$ is estimated with Eq. (11), whereas $E2m$ is estimated with Eq. (16). We will present a more clear description on the separated ET components in the revised manuscript.

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