

Transport of water vapour over the Tibetan plateau as inferred from the model simulations

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Abstract: This paper discusses the transport of water vapour in the tropopause region over the Tibetan Plateau, where high water vapour mixing ratio is observed during the Northern Hemisphere (NH) summer-monsoon period. The Weather Research and Forecasting (WRF) model has been used to study the two contrasting cases i.e. when water vapour is high and low at 100 hPa (close to tropopause). The composite distribution of water vapour shows two key results (a) the water vapour appears to be transported to the Tibetan plateau region from the extra-tropics under the influence of stronger northwesterly winds and (b) the vertical water vapour flux is relatively higher over the Tibetan Plateau region during the period when water vapour amount at this level is higher. This suggests that in addition to the horizontal transport from the extra-tropics, the local convection occurring over the Tibetan Plateau also contributes to the increase in the water vapour over this region. The differences in the circulation during high and low water vapour cases suggest that a cyclonic circulation difference over the central Indian region limits the transport of water vapour from the Bay of Bengal to the Tibetan Plateau region.