



Cross-tropopause transport by convective overshoots in the Tropics

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The increase in the stratospheric water vapour is explained partly by the troposphere stratosphere exchanges in the tropics. However the mechanisms of exchange remain much discussed between slow transport by radiative forcing from the base of the layer of tropical transition (TTL) and fast convective transport directly to the lower stratosphere. The recent observations of particles and water vapour measured in the TTL and nearby the convective systems in Brazil and in Africa can be explained by transport through convection overshoots only. In support with these observations, the mesoscale models are a powerful means of interpretation whose contribution for the study of troposphere stratosphere exchanges will be re-examined. A case study combining in an original way hectometric resolution and real meteorological conditions will be presented. After having checked the realism of the convective towers by comparison with the satellite observation and its sensitivity to the microphysics, the role of the major convection as elevator for stratosphere will be shown. This will be further demonstrated for an African squall line. The limits and the consequences on a global scale of the results from these case studies will be discussed.