Atmos. Chem. Phys. Discuss., 9, C5812–C5813, 2009
www.atmos-chem-phys-discuss.net/9/C5812/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Hydration and dehydration at the tropical tropopause" *by* C. Schiller et al.

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Received and published: 9 October 2009

We found this manuscript on water vapor transport into the stratosphere to be very interesting, a creative application of observations combined with Lagrangian simulations. Here we'd just like to point out that several similar results can also be obtained with a Eulerian general circulation model, as we have shown in Lelieveld et al. (2007). In particular our study supports the conclusions of Schiller et al. that: convection moistens the TTL, rather than dehydrating it; the input of water vapor (at extremely supressed mixing ratios) is largely controlled by large-scale transport across the cold tropical tropopause, with associated freeze-drying (condensation and sedimentation), in which radiative processes, modulated by clouds, also play an important role; and very deep overshooting convection penetrating into the stratosphere does not play a

significant role in the stratospheric water vapor budget. What our global model results also add to this is in terms of geographical distribution: in our study, we found that very deep summer monsoon convection over Southeast Asia, centered over Tibet, is especially important for moistening the stratosphere. This information may be helpful in further refining this already very solid interpretation of these interesting observations.

Reference:

Lelieveld, J., Brühl, C., Jöckel, P., Steil, B., Crutzen, P. J., Fischer, H., Giorgetta, M. A., Hoor, P., Lawrence, M. G., Sausen, R., and Tost, H.: Stratospheric dryness: model simulations and satellite observations, Atmos. Chem. Phys., 7, 1313-1332, 2007.

http://www.atmos-chem-phys.net/7/1313/2007/acp-7-1313-2007.html

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 17495, 2009.