



Transport of water vapour at the tropical tropopause

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To determine the role of convective transport in the stratospheric water vapour budget, it is important to know the detrainment altitude of clouds compared to the altitude of the cold point of the tropopause. Until recently, the detrainment altitude was not precisely known as it was estimated from infrared brightness temperatures converted into altitudes using meteorological analyses of temperature profiles. The analysis of SEVIRI brightness temperatures at high temporal resolution, together with the data of the CALIOP lidar and the CLOUDSAT radar, allows to detect moisture layers above anvils. Back-trajectories constructed with analysed winds of diabatic heating rates, and coupled with these data, identify convective sources for stratospheric air masses. Back-trajectories can also be calculated from the outputs of the LMDZ General Circulation Model, and the comparison of the two trajectories datasets validates the transport of stratospheric water vapour into the stratosphere in the GCM. The objective of the comparison is to improve the convective parameterizations of the GCM at clouds tops, by refining the representation of the detrainment and the sedimentation of the ice crystals.