Geophysical Research Abstracts,
Vol. 11, EGU2009-10507, 2009
EGU General Assembly 2009

LMDZ GCM simulations at the tropical tropopause

M. Bonazzola, B. Legras, and M. Bolot
Université Paris VI, LMD, Paris Cedex 05, France (mbonaz@lmd.jussieu.fr, 0033-1-44274772)

The tropical tropopause plays a crucial role for the stratospheric water vapour budget, as most of the stratospheric water originating from the troposphere has gone through its cold temperatures. The stratospheric water vapour partly controls ozone chemistry, and has a large
radiative effect in the stratosphere, on the thermal structure of the tropopause, and even at the surface. In its solid phase, the tropopause water has a global climatic impact through the radiative effect of cirrus.

In this paper, simulations of the General Circulation Model LMDZ, performed at a high vertical resolution (40 levels), are compared with ERA-40 and ERA-Interim data. First results show a dry and a cold bias (of about 2 degrees) at the tropical tropopause, and a high cloud cover 20%
larger than in the ERA-Interim, inducing a radiative cooling in the lower stratosphere which may alter the tropo-stratospheric transport. Sensitivity tests to microphysical parameters (e.g. the proportion of precipitating ice), and to a simple parametrization of super-saturation coupled with the Bony and Emanuel (2001) LMDZ cloud scheme, are performed and analysed.