Summary

- Sondes
  - RS 80 has dry bias. RS 92 virtually without bias
  - Snow White measures higher than RS 92, but Peletier cooling is not enough for strat. meas.
  - LAUTLOS: NOAA CFH and FLASH compare very well down to 5 km.
  - WMO intercomp in Mauritius in Feb 05.
    - Vaisala, Snow White and Sippican. Is report out?
    - GCOS: Move towards a new and better radiosonde
  - CFH may fail in thick liquid clouds.

Summary

- Sondes (Flash, CFH) are probably the best solution for the UTLS region due to the good vertical resolution.
- Flash can be reused.
- We should have stations with a suite of water vapour instruments.
  - Bern/Payerne is one possibility.
  - We also need stations in the tropics

Summary

- FT-IR
  - Hitran 2000 gives much better wv profiles than Hitran 96.
  - Approx. 3 independent layers.
  - Very accurate H2O columns
  - Improved retrieval of UT H2O by combining strong lines and moderately strong lines.
  - FT-IR well suited for middle troposphere.More difficult in the UT.
  - Reanalyse old data from e.g. Kitt Peak.

Lidars

- Two different techniques:
  - Raman lidar. Altitude range: surface – 15 km (hygropause) at nighttime. Up to 8 km at daytime.
  - DIAL (needs to break world records in laser technology). Altitude range: surface-13 km (hygropause) above ground any time. Valid for high altitude site. From a dry site potential to go to 25-30 km
- Raman lidar needs calibration. One point along the profile suffices.
- DIAL is absolutely calibrated

Microwave

- Altitude range: 20-80 km
- How well do we know the spectroscopic parameters?
- How much does the temperature profile influence the water vapour profile?
- Europeans and Americans are using different forward models.
- QPACK retrieval code used by some, but not all.
- Should the MW working group have a travelling standard like for the FT-IR and lidar WGs.
- Possible for some MW instr. to participate at the Table Mountain intercomp. in Oct. 2006?

Combining MW and other techniques

- Cross validation of satellites by a GB station
- Cross validation of GB stations by a satellite
- ”Assimilating” various other measurements in the MW retrieval can give a continuous ”smooth” H2O profile from the ground to the mesopause. More work is needed to develop the technique.

Next steps

- Workshop report.
  - Rapporteurs send their ”clean” notes to Geir. ”Clean” = Good English with complete sentences. No telegram style. Deadline 15.7.2006.
  - Geir makes draft report that is circulated to the participants. 21.7.2006.
  - Feedback on draft report by 8.9.2006.
  - Final report by mid Sept. based on feedback.
  - Presentation of report at SC meeting at OHP late Sept.
- Make an inventory of existing H_2O measurements within NDACC. Send info that you might have on existing H2O measurements.
- Identify stations that would be suitable/desirable for Flash or CFH measurements. Coordinate with satellite overpasses.
- Follow-up meeting?
- Water vapour Session at EGU 2008?