

MIPAS H2O ACVT GBMCD

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MIAWARA (Middle Atmospheric Water Vapour Radiometer)



Ground - based microwave
radiometer @ 22 GHz

Water vapour profiles:
daily mean: 25-70 km
(no measurement during
rainfall)

Place of Operation:

2003: all year

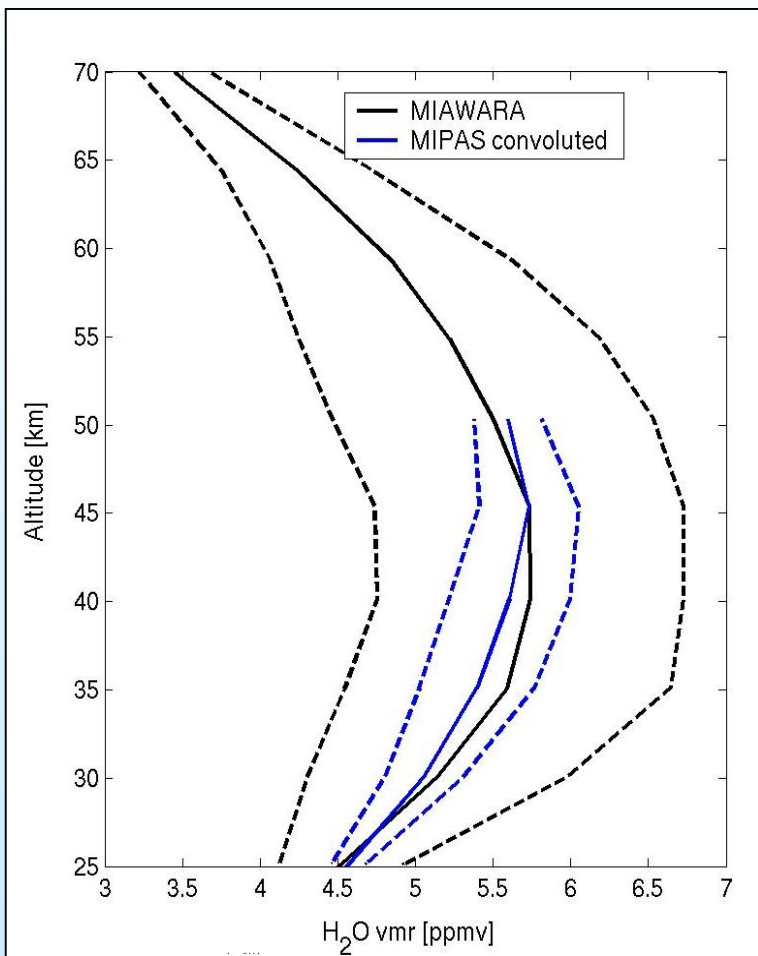
Bern, Switzerland, 46.95 N, 7.45 E, 550 m asl.

**2004: Feb – Apr
May – Dec**

**Sodankylä, Finland (February – April), 67.3 N, 26.7 E, 180 m asl.
Bern, Switzerland**

University of Bern

Sample of Intercomparison Feb-17-2003, Bern, Switzerland



Comparison Method:

- Reducing MIPAS profile to lower microwave profile grid
- Folding MIPAS profile with microwave averaging kernels and a priori information

Literature:

Deuber et al.- IEEE Trans Geoscience and Remote Sensing, vol 45, 2004

Contact: beat.deuber@mw.iap.unibe.ch

V. Rizi, M. Iarlori, G. Redaelli, G. Visconti
University of L'Aquila, Italy

**Raman Lidar and
Vaisala PTU & PTO3 Radiosonde**

Site: 42.35N, 13.22E, 683m a.s.l.

ROUTINE MEASUREMENTS (Twice a week)

Tropospheric Aerosols (LIDAR)

Water Vapour (BALLOON & LIDAR)

Liquid Water (LIDAR)

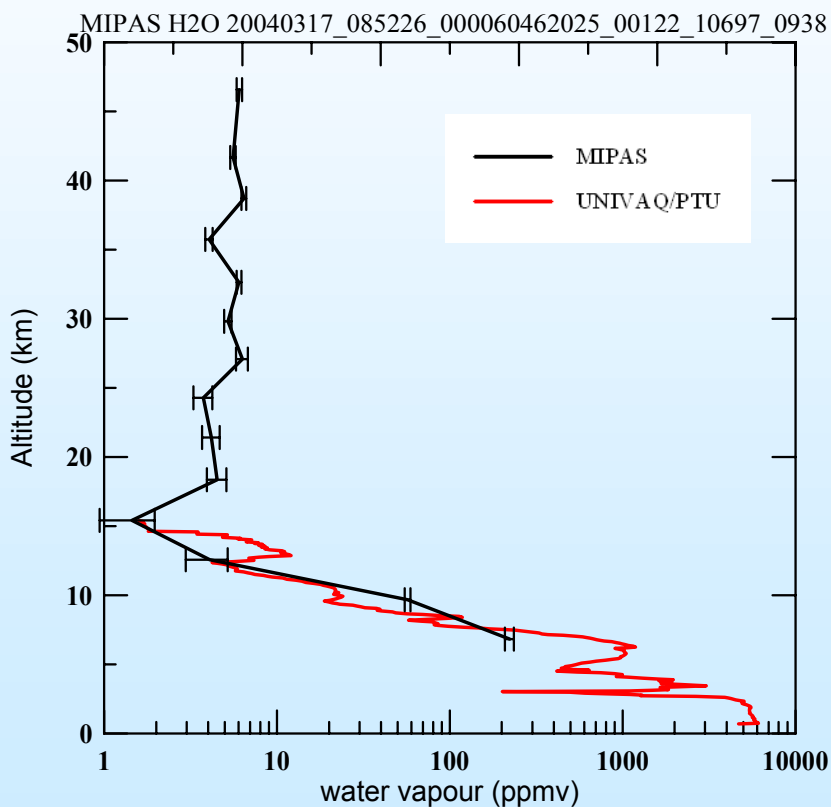
PRESSURE & TEMPERATURE (BALLOON),

OZONE (BALLOON, Once every 15days)

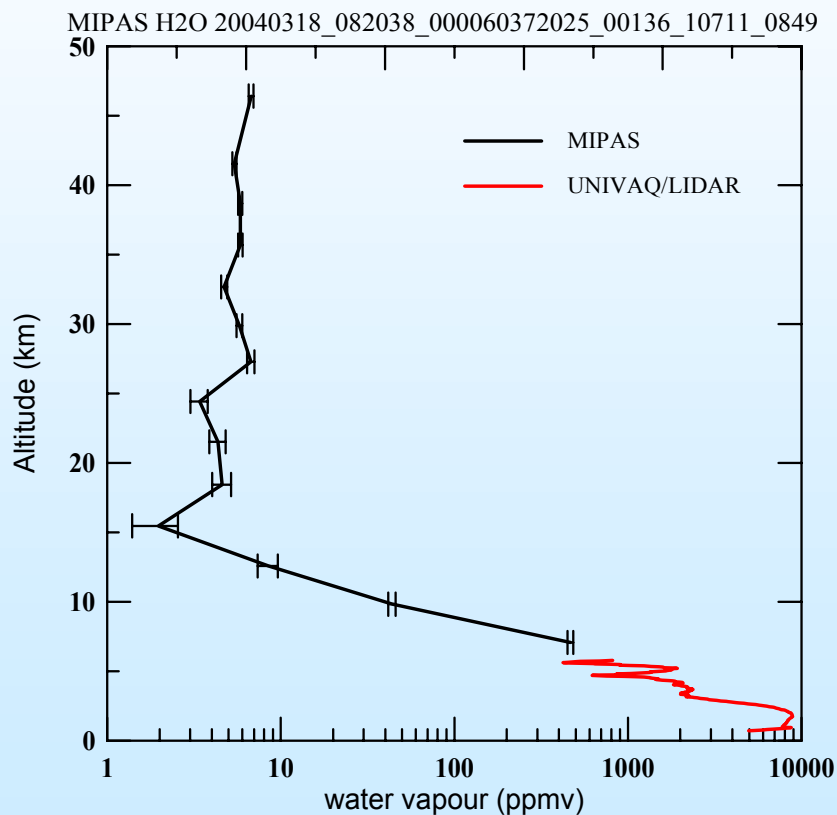


University of L'Aquila

Mipas-Radiosonde 03-17-2004



Mipas-Lidar 03-18-2004



T. Colavitto, P. D'Aulerio, F. Congeduti
ISAC-CNR, Italy

Radiosonde RS90 Vaisala PTU

Pratica di Mare (25 km South-West of Rome) by Italian Meteorological Service of A.M.

Raman Lidar

Tor Vergata 41.84°N, 12.65°E
115m a.s.l.

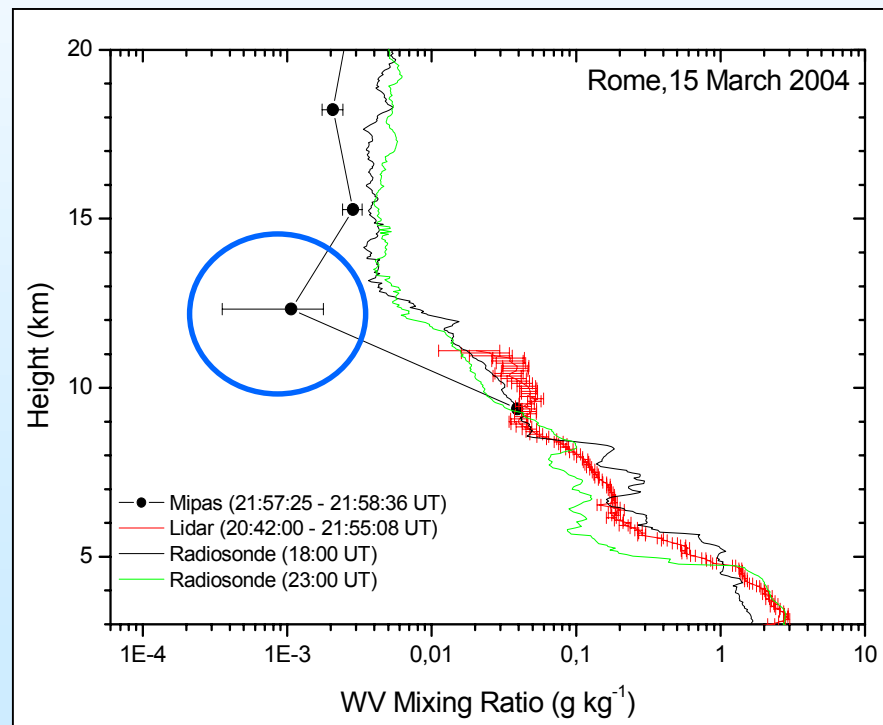
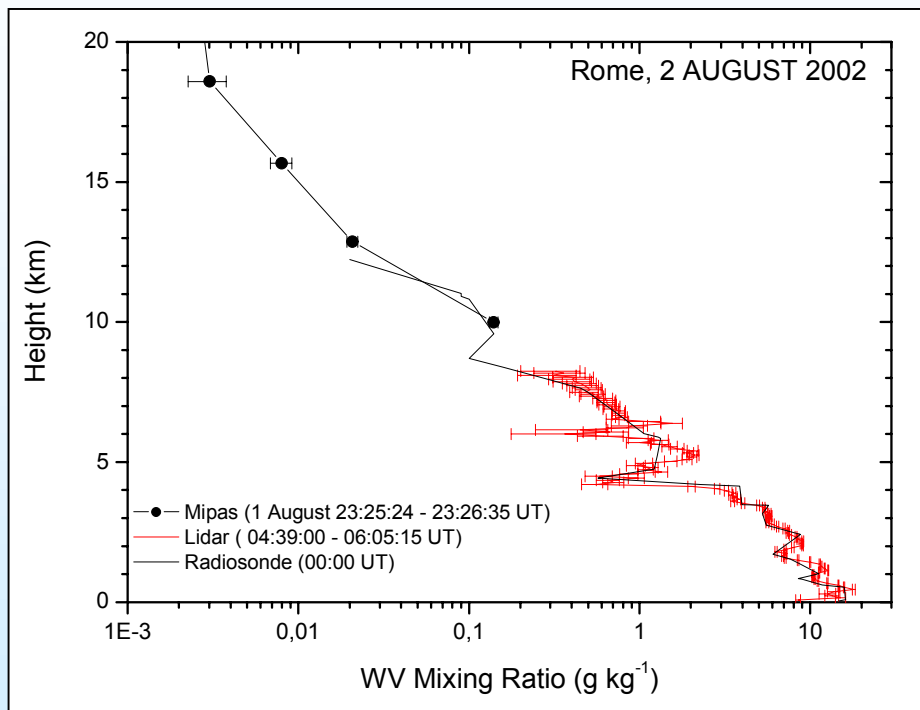
Lidar Validation Campaign

Period: August 2002 - March 2004

23 measurements in coincidence of Mipas overpasses

10 comparisons with Mipas L2 version 4.61 water vapor data

ISAC-CNR



ISAC-CNR

- Even after recent reprocessing, MIPAS profiles rarely overlap the top altitude of ISAC Lidar
- In case of overlapping, the lowest point of MIPAS sometimes presents WV mixing ratios lower than ISAC Lidar
- Frequently MIPAS underestimates the radiosonde profile as well
- In the March 2004 cases, the MIPAS second point (~12km) clearly underestimates the radiosonde measurements

A. Amodeo, C. Cornacchia, L. Mona, M. Pandolfi, G. Pappalardo, V. Cuomo

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Raman Lidar & Radiosonde RS80 Vaisala PTU

Tito Scalo 40°36'N, 15°44'E 820m a.s.l.

Validation Campaign

July 2002-Dec 2002: 2 measurements per week

Starting from Jan 2003: 1 measurement per week

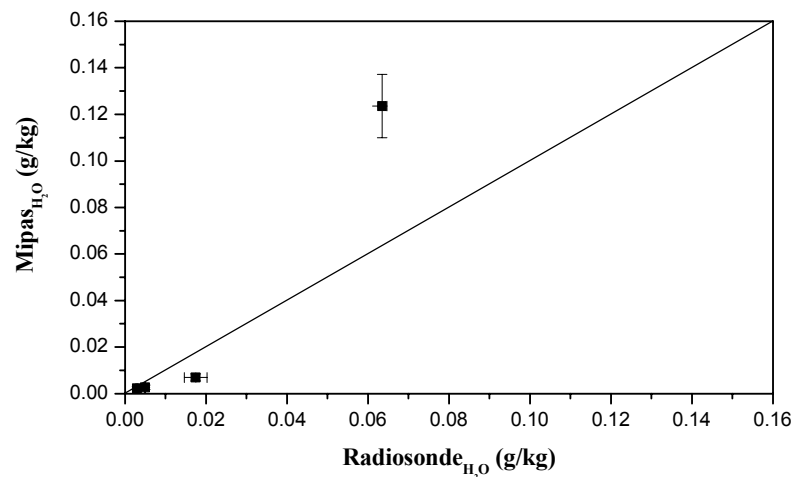
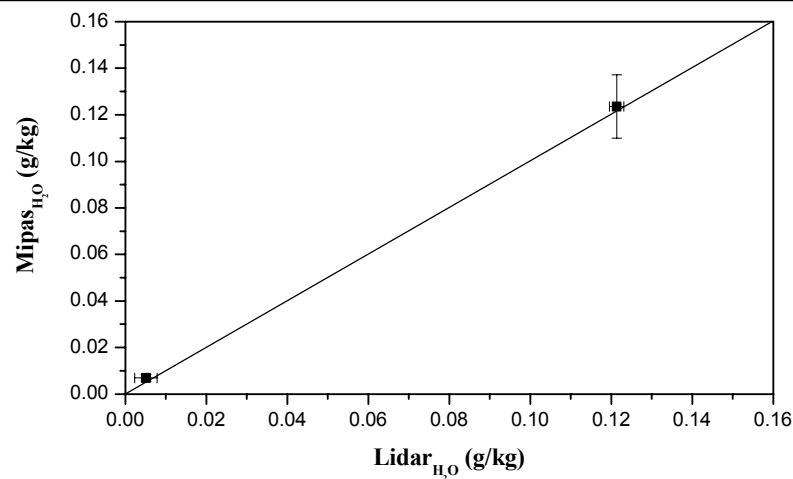
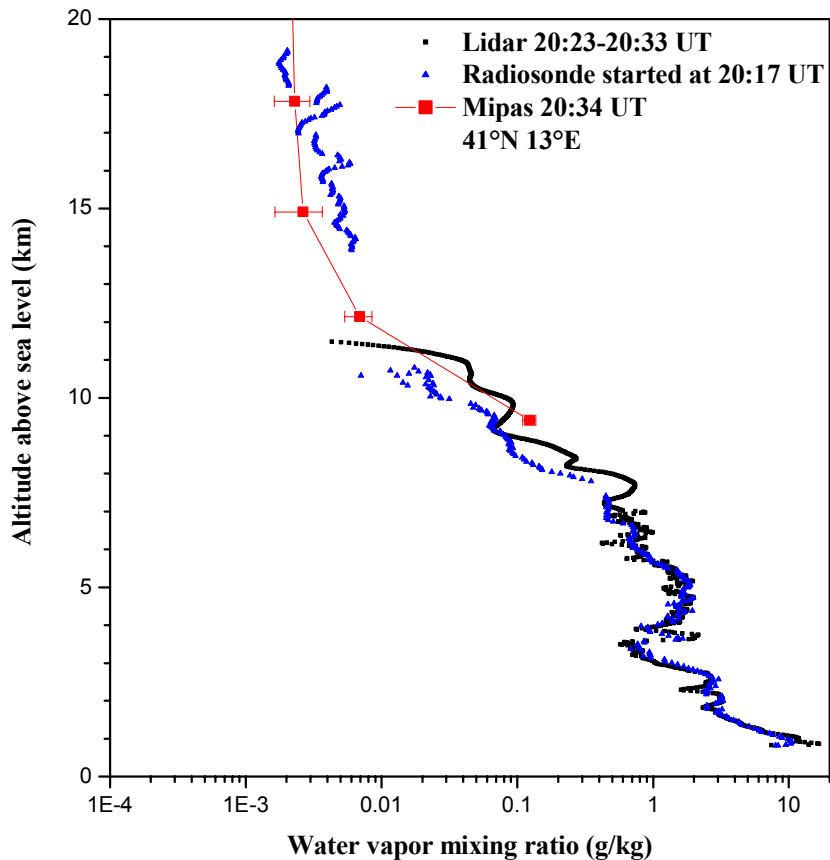
82 lidar and 51 radiosondes measurements in coincidence of Mipas overpasses

16 comparisons between lidar and Mipas L2 version 4.61 water vapor data

14 comparisons between RS80 and Mipas L2 version 4.61 water vapor data

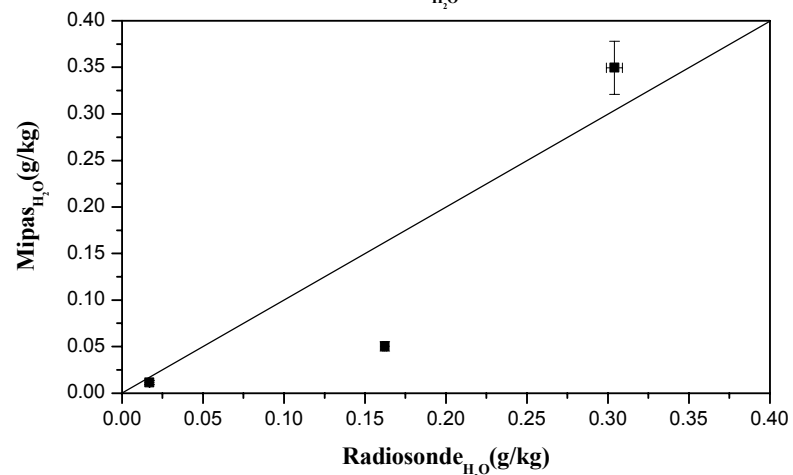
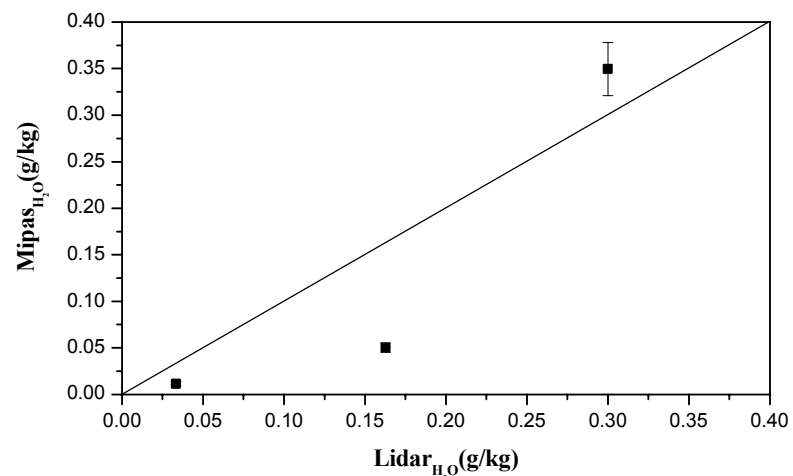
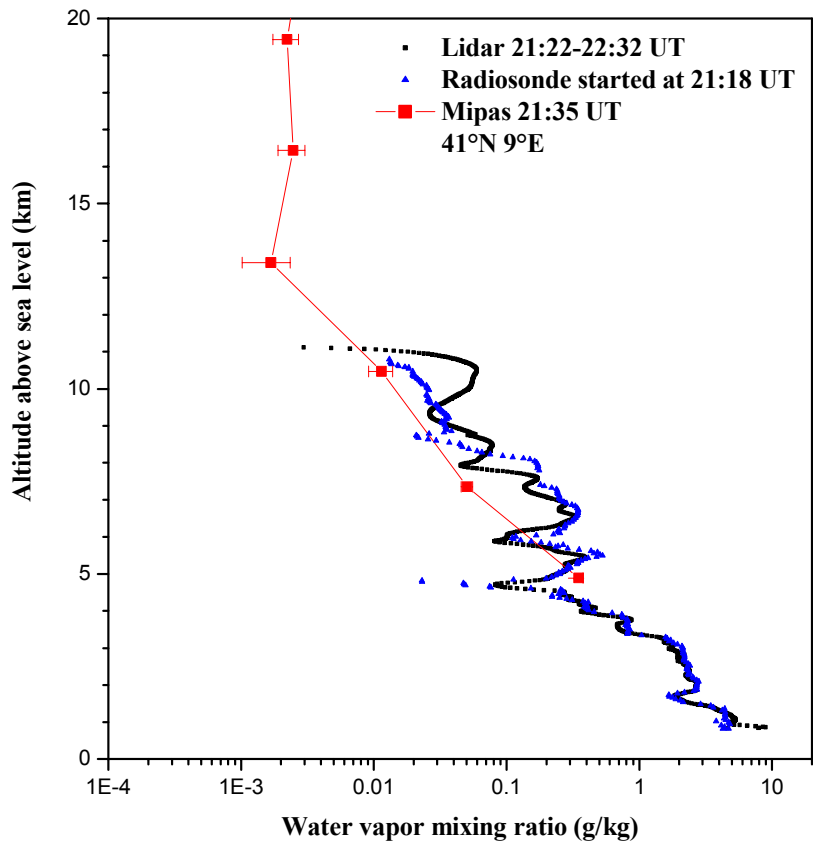
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16 October 2002



IMAA-CNR

23 April 2003



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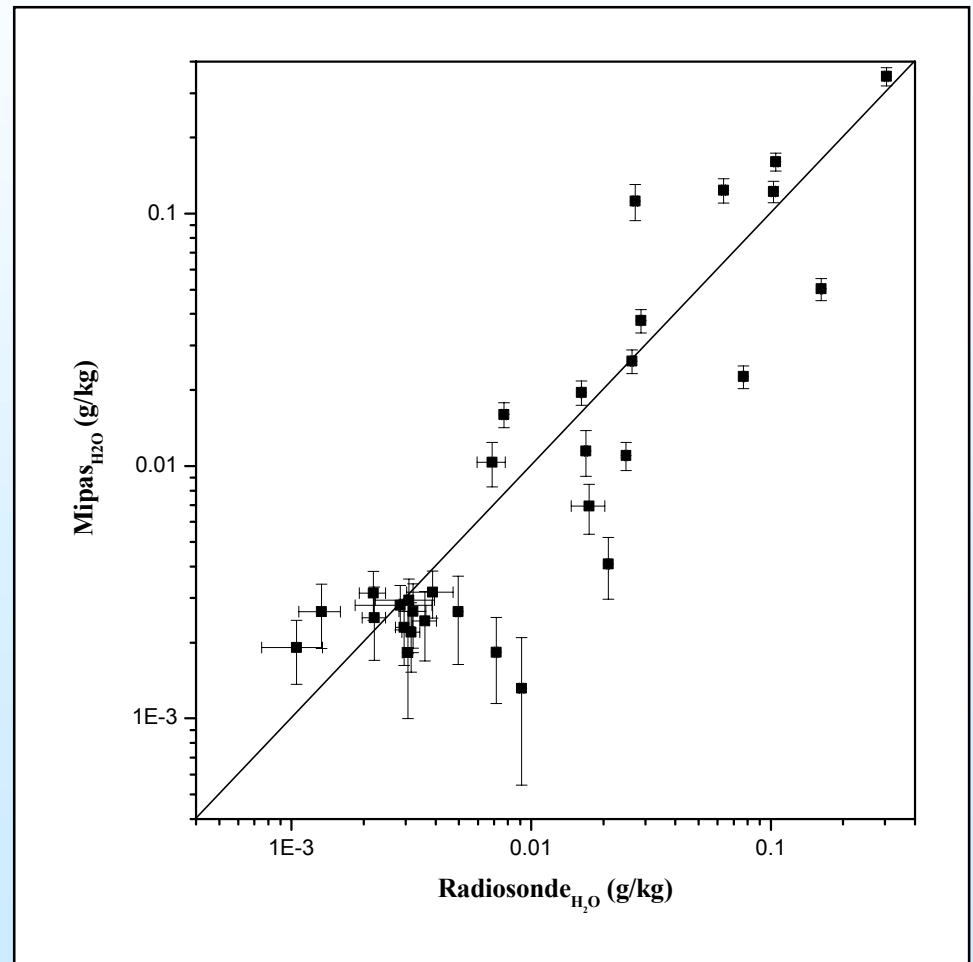
Mipas vs. Radiosonde

Maximum distance 1000km

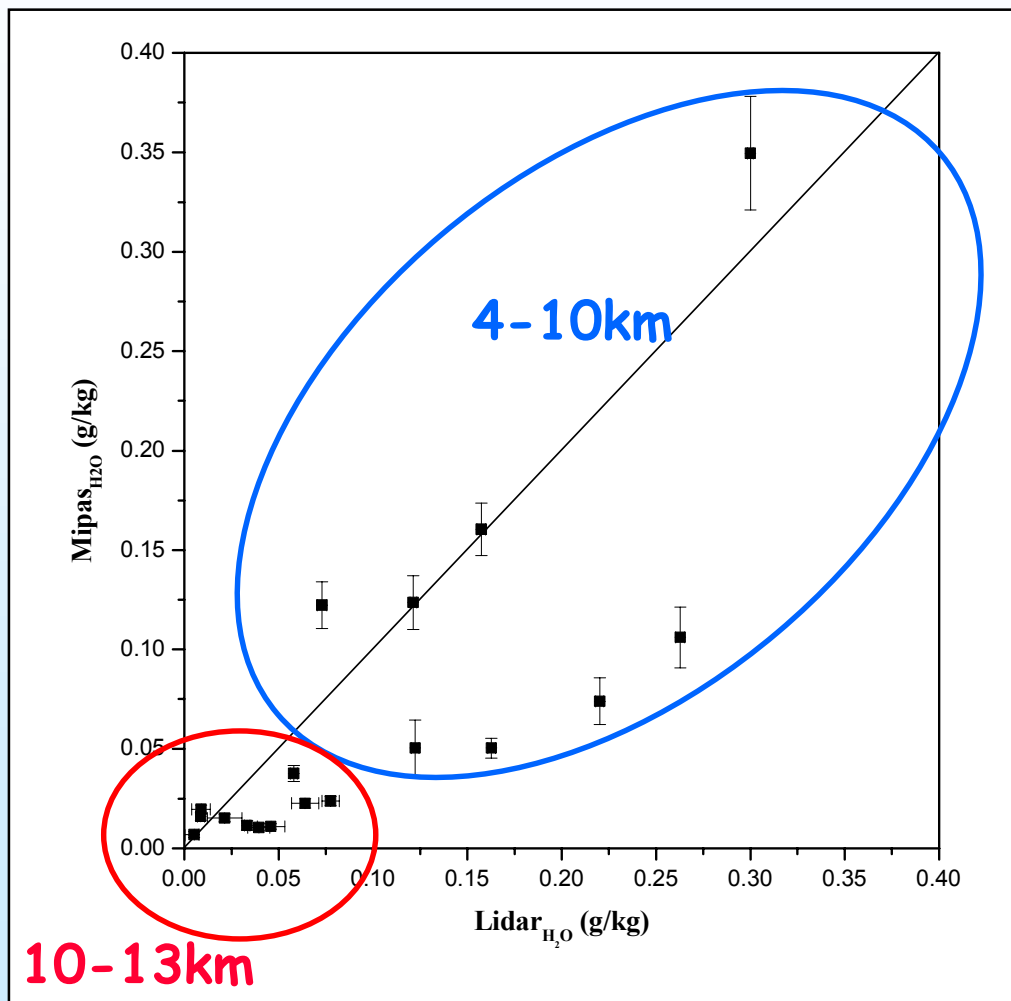
Maximum temporal difference
2h 30min

Comparisons Mipas 4.61 vs.
RS80 water vapor data for 14
days.

47 values have been compared.



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Mipas vs. Lidar

Maximum distance 1000km

Lidar profiles obtained in coincidence of Mipas overpasses.

Comparisons Mipas 4.61 vs. Lidar water vapor data for 16 days.

24 values have been compared.

Conclusions

- Comparisons with Lidar and Radiosonde.
- MIPAS 4.61 OFL H₂O profiles often reach 9 km of altitude
 - A general good agreement has been observed
- Both IMAA and ISAC Lidar measurements show that MIPAS often underestimates water vapor mixing ratio at 10-13 km.
 - Radiosonde profiles confirm this underestimation.
- Further expansion of MIPAS Validation Dataset could lead to more quantitative results.