
Comparison of profiles retrieved from SCIAMACHY-measurements and from ground based microwave radiometry

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Overview

- Where we are and what we do.
 - Results of a statistical comparison of ozone profiles.
 - First results of water vapour profiles.
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Locations



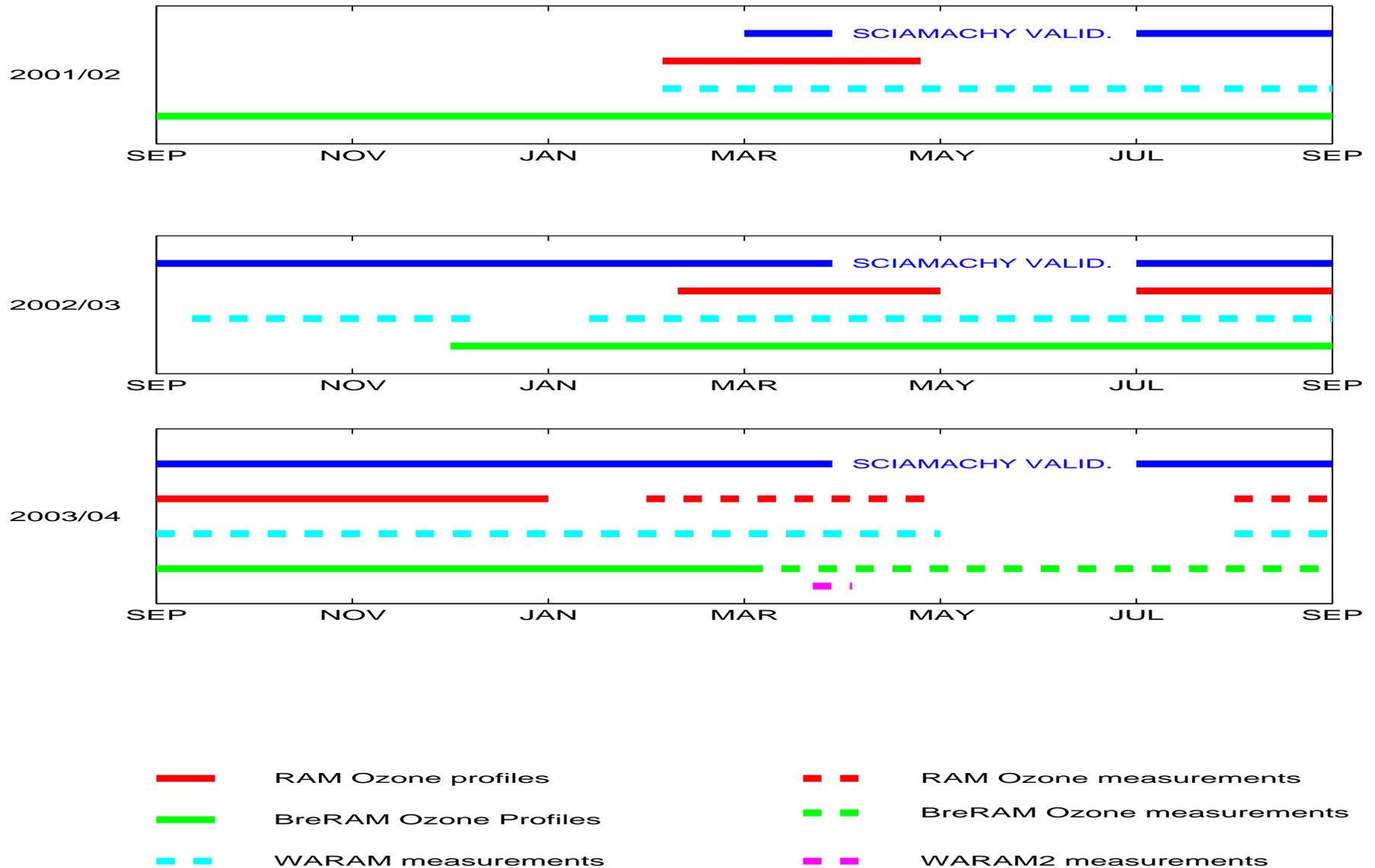
State of the RAM instruments

- OZORAM (Ozone) and WARAM (Water vapour) on Svålbard and BreRAM in Bremen are fully operational.
 - WARAM 2 (Water vapour) in Mérida, Venezuela is set up since March 2004 and becomes fully operational in January 2005. It has been delayed for about 2 years due to political unrest in Venezuela.
 - First water vapour profiles from Ny-Ålesund and Mérida could be retrieved and were compared with MIPAS and HALOE.
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The Instruments

	SCIAMACHY	BreRAM OZORAM	WARAM WARAM 2
Pixel size	1000x400 km	20 x 20 km	20x20 km
Geometry	Limb	Upward zenith	Upward zenith
Sensitivity	15-40 km	15 - 70 km	25 - 55 km
Resolution	5 km	> 15 km	12-16 km

Data set of the various RAM's



Requirements for the comparison

Measurements of RAM and SCIAMACHY are regarded coincident, if

- the SCIAMACHY window plus 500 km covers the respective radiometer location,
- the mean of the column within SCIAMACHY measurements does not differ more than 5 % from the column above the RAM location,
- the variation of the column within the SCIAMACHY windows is less than 10 %.

Number of measurements above Bremen about 120 per Year.

Method of the comparison

	found until Dec 2003	compared
Bremen (53 N, 8 E)	60	34
Ny Alesund (79N, 11 E)	80	36

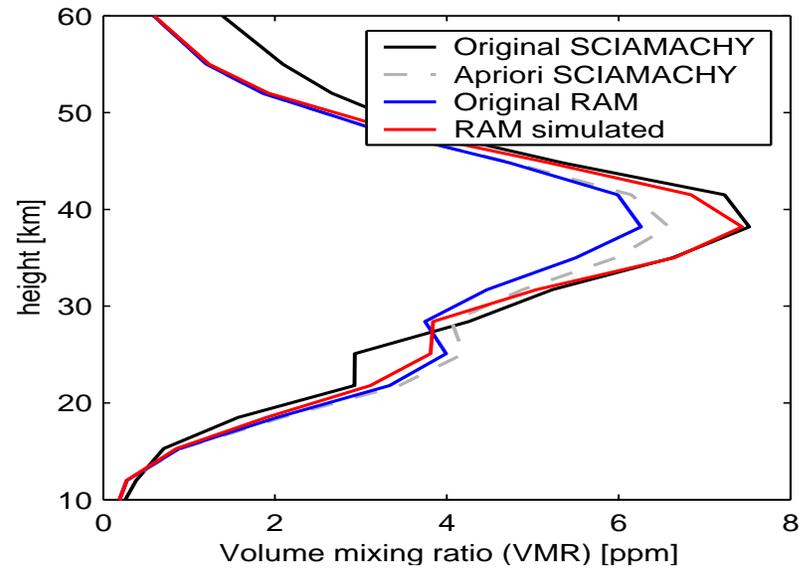
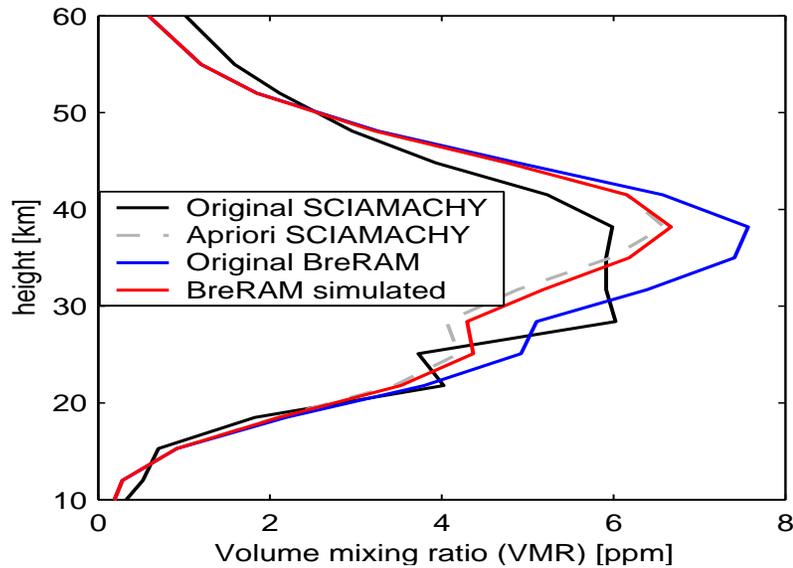
Method:

- Comparison of RAM-profiles with simulated retrieval using SCIAMACHY profiles (Rodgers and Connor 2003).
- Advantage: Uncertainty induced by this comparison is of the order of the noise of the profiles. Direct comparison induces a much higher uncertainty.

Features compared:

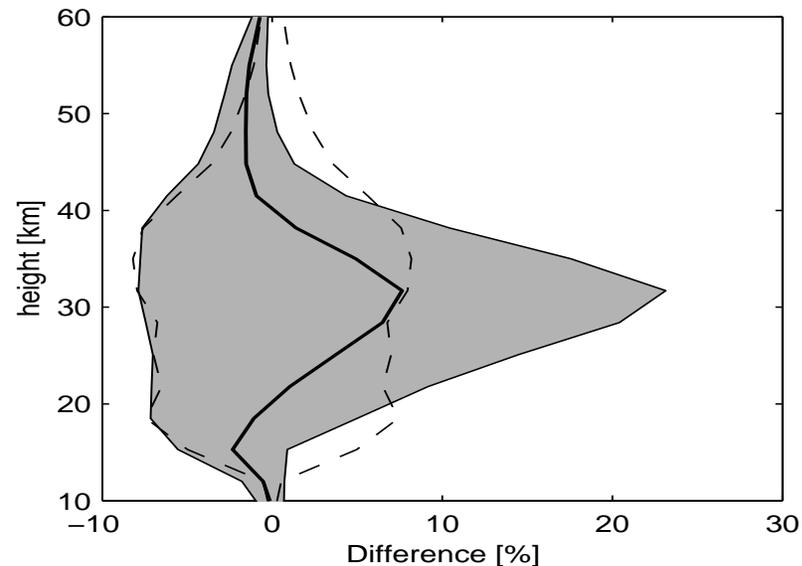
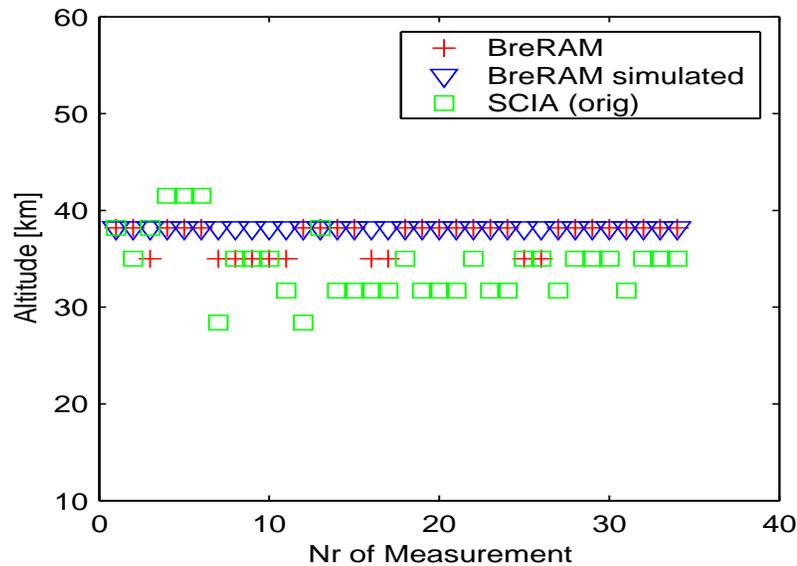
- Altitude of the maximum O_3 vmr.
 - Difference of the O_3 profiles.
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Examples



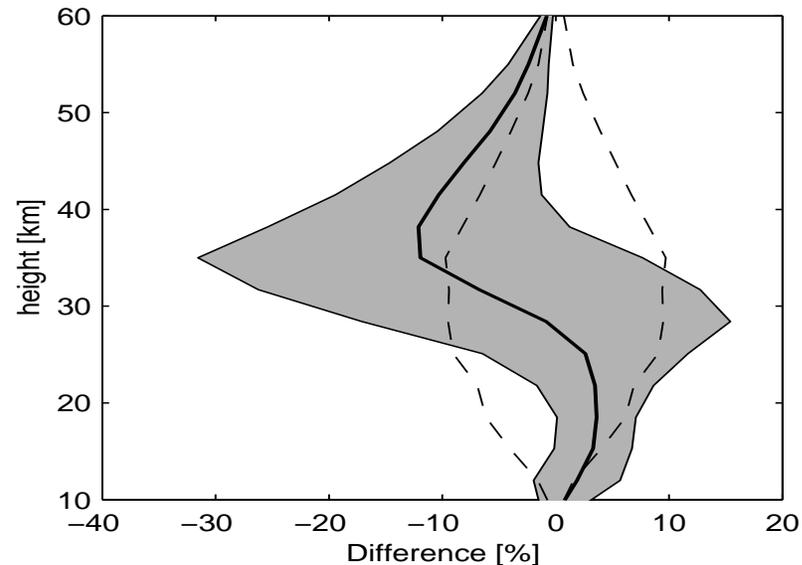
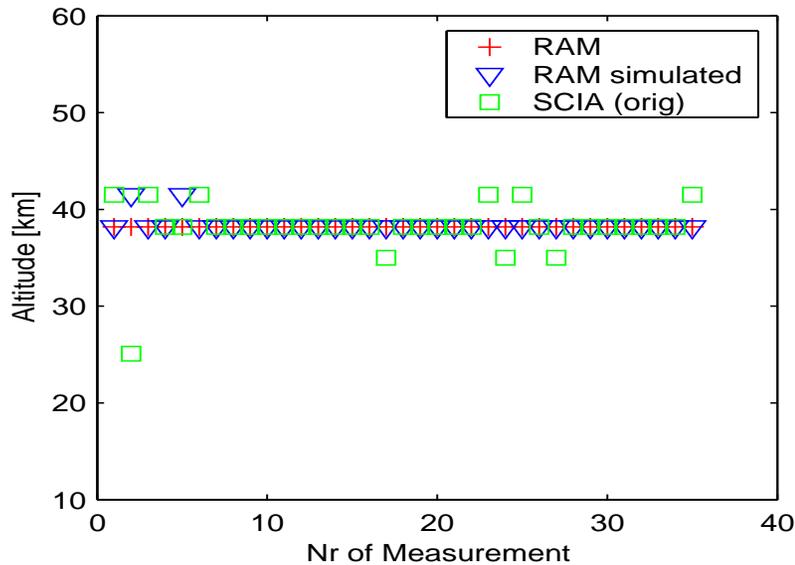
- General shape of profile is similar.
- Comparison very sensitive to the a priori profile.

Results: BreRAM-SCIAMACHY



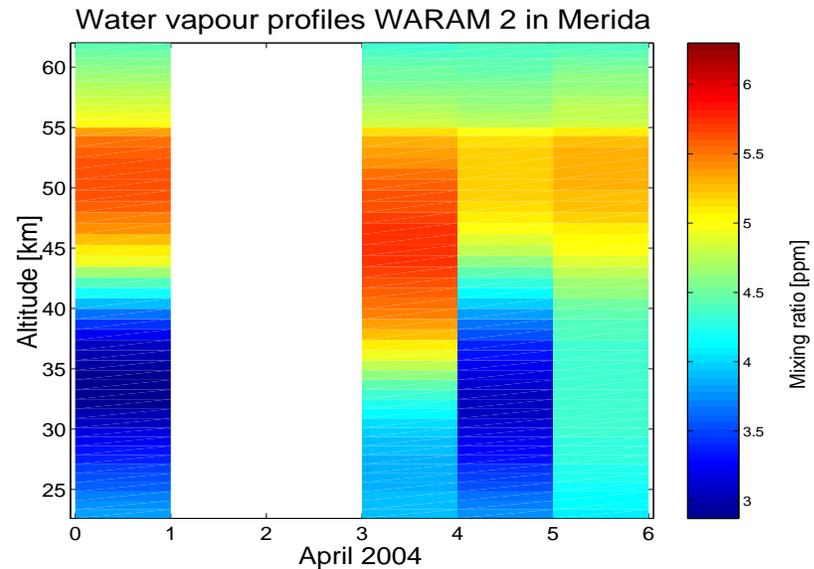
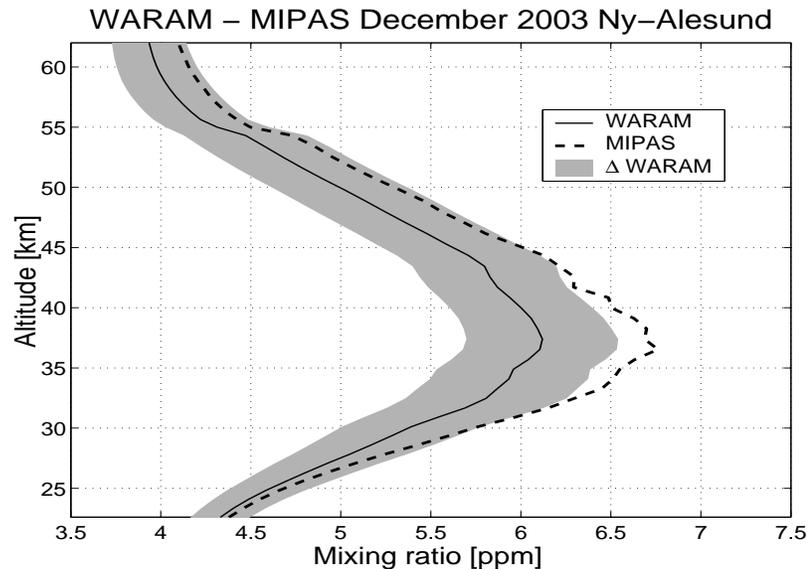
- Altitudes of the maximum vmrs are the same in 25 % of the cases. Differences are minimal and not more than one altitude level where the gradient of the O_3 vmr is small.
- Profiles match within the errorbars. BreRAM tends to find higher vmr-values than SCIAMACHY.

Results: RAM-SCIAMACHY



- Altitudes of the maximum vmrs are the same in all but two cases. Differences are again only one altitude level where the gradient of the O_3 vmr is small.
- Difference of profiles match with the errorbars below 35 km. Above 35 km RAM tends to find lower values than SCIAMACHY.

Results: WARAM 2



- Water vapour profiles from Ny-Ålesund (December 2003), Mérida (31.03.2004 - 5.04.2004) and Zugspitze (March 2003).
- First comparisons with MIPAS and HALOE show reasonable agreement.
- Altitude of the maximum vmr is retrieved.

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