

Early Results from SCIAMACHY

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University of Bremen
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Remark

- These first results are a preliminary attempt of the Bremen group on retrieving trace gases from uncalibrated level 0 (raw) data in the three observation geometries nadir, limb and occultation.
- These preliminary results should give confidence that SCIAMACHY is in good shape.
- First results on validation of SCIAMACHY products will be reported at the Validation Review in the second week of December.
- First Result Pages:

<http://www.iup.physik.uni-bremen.de/sciamachy>

So far done in Bremen

Limb:

- ✓ O₃ profiles
- ✓ NO₂ profile
- ✓ PMC/NLC
- ✓ Mesospheric O₃

Solar Occultation:

- ✓ O₃ profiles
- ✓ NO₂ profile

Nadir

- ✓ CH₄
- ✓ NO₂

First Result Pages: <http://www.iup.physik.uni-bremen.de/sciamachy>

LIMB MEASUREMENTS



Sun



SCIAMACHY



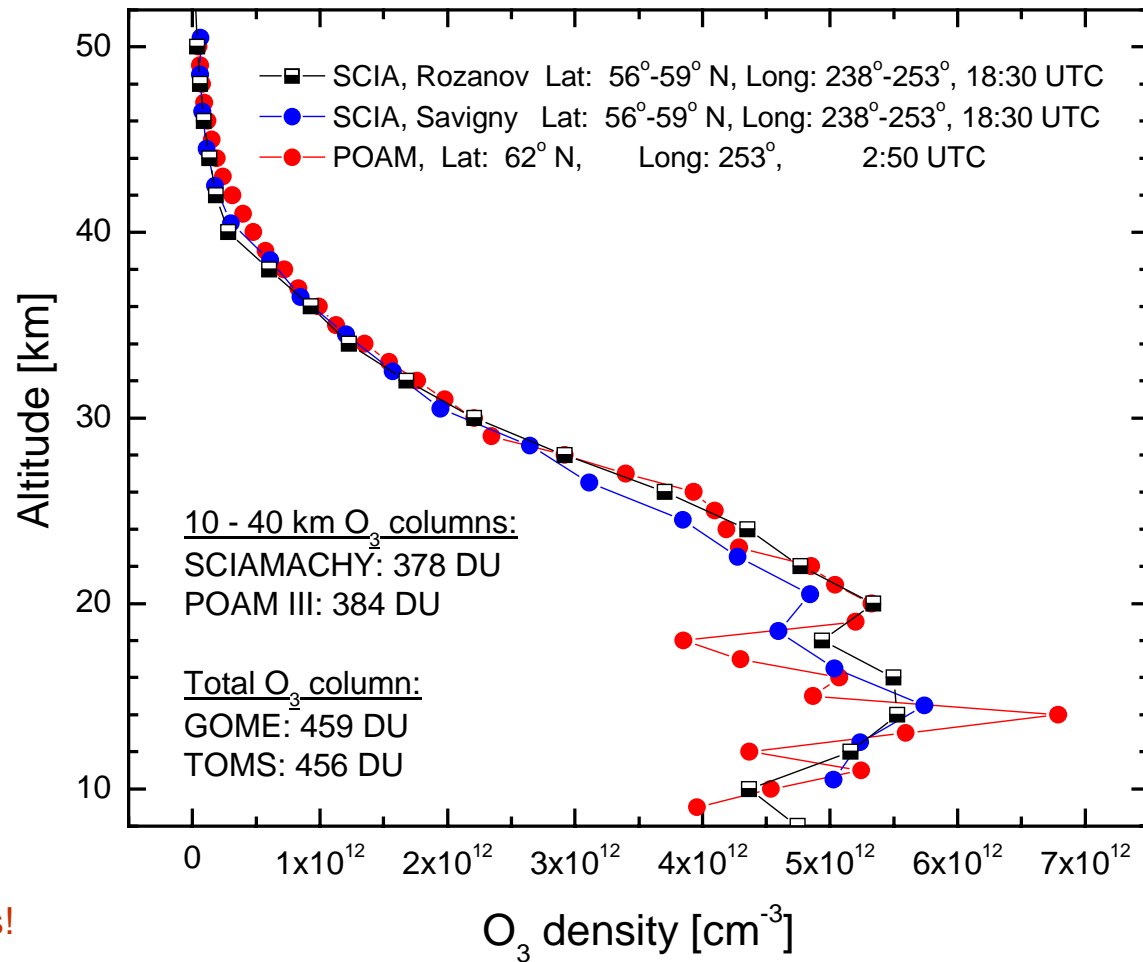
Earth



Universität Bremen



Ozon from Limb



Preliminary results!

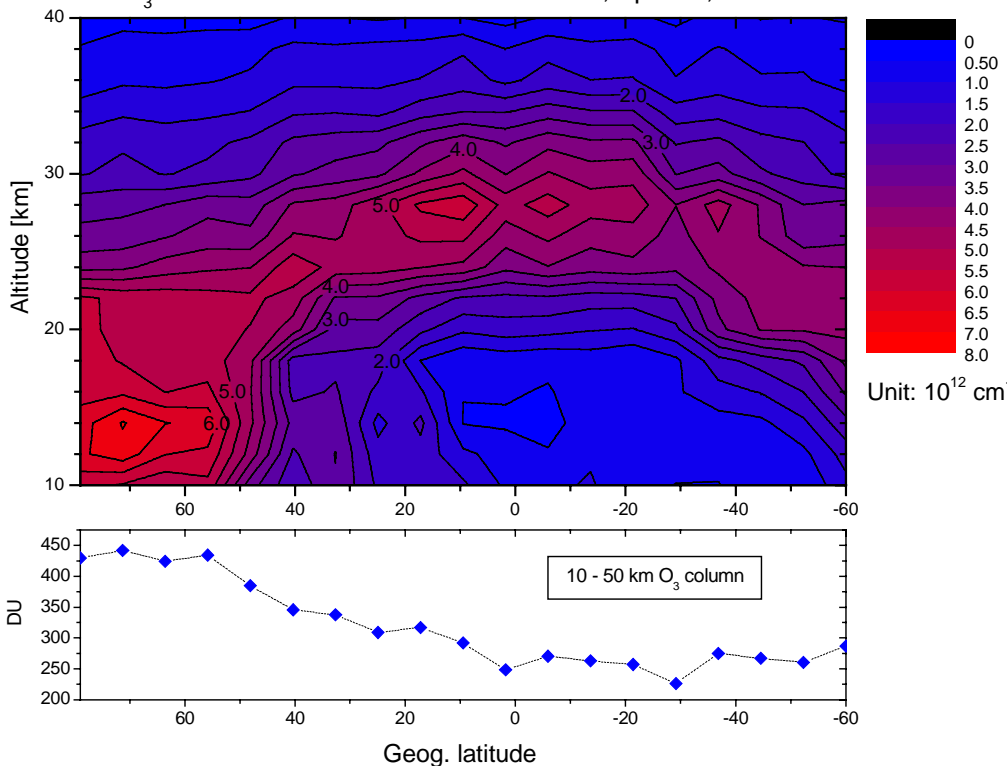
Rozanov: Differential retrieval employing O_3 Huggins and Chappuis bands

Savigny: 3 wavelength retrieval employing O_3 Chappuis bands

O₃ SCIAMACHY and GOME

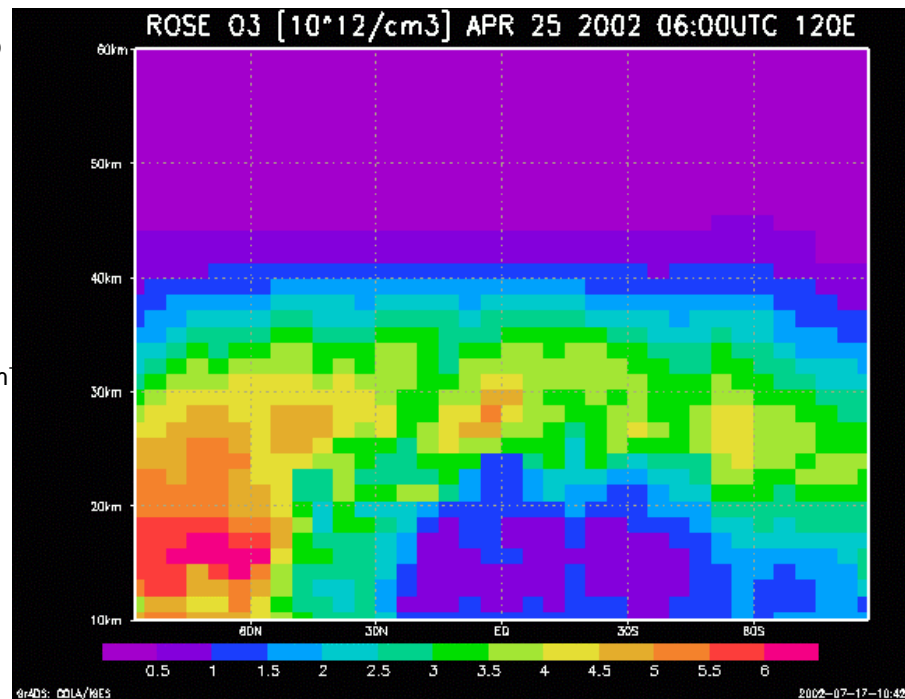
O₃ measured with SCIAMACHY:

O₃ densities from SCIAMACHY Orbit 798, April 25, 2002



Assimilated GOME O₃ Data:

CTM assimilation (NCAR-ROSE)

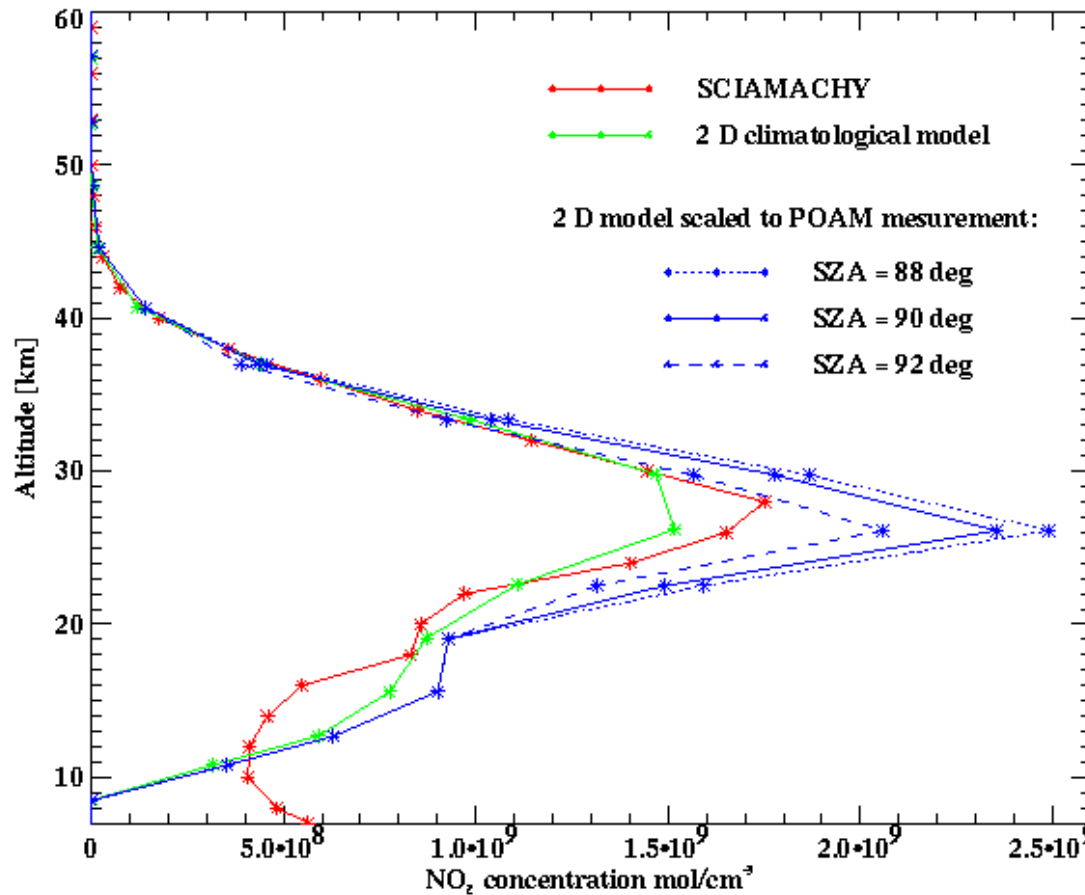


Savigny et al. 07/2002

Preliminary results!

Courtesy of Michael Bittner (DLR-DFD)

NO₂ from limb



Preliminary results!

A. Rozanov et al. 07/2002

SCIAMACHY: 58° N, 110° W, SZ A = 68 deg

POAM: 62° N, 110° W

Green curve: simulation with 2 D Model at 58° N, 110° W, SZ A = 68 deg

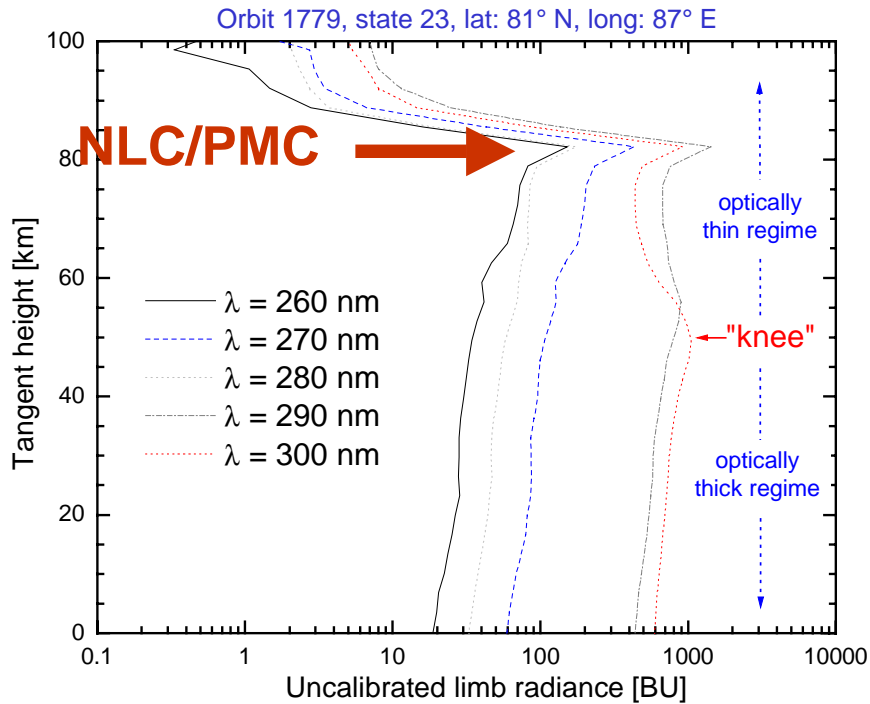
Blue curves: simulation with 2 D Model at corresponding SZ A.

NO_x was scaled to the POAM measurement and used as input to simulate the diurnal variation of the NO₂ vertical profile backward to SZ A = 68 deg. (All model runs by Miriam von Koenig)

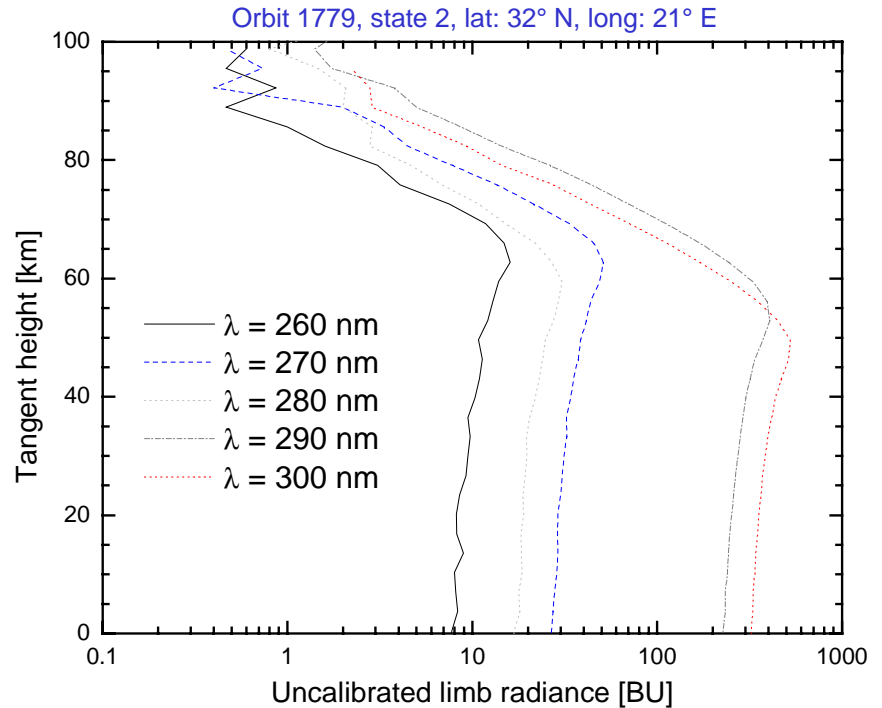
First observations of noctilucent clouds

UV limb radiance profiles

with NLC



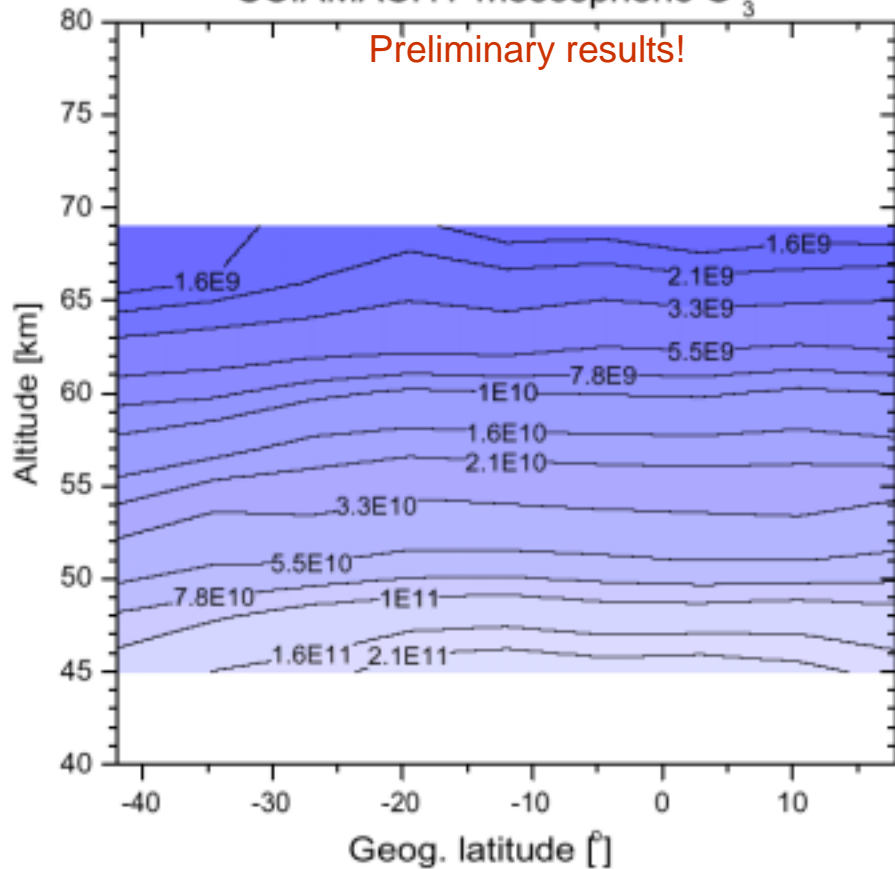
without NLC



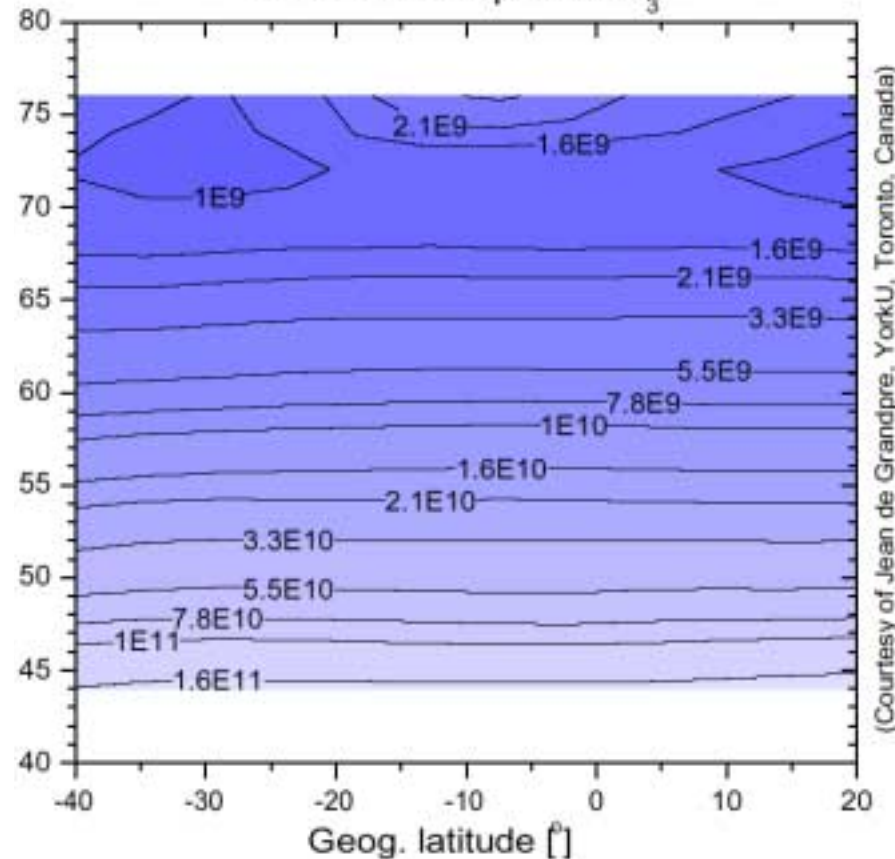
Mesospheric O₃

SCIAMACHY mesospheric O₃

Preliminary results!



CMAM mesospheric O₃



(Courtesy of Jean de Grandpre, YorkU, Toronto, Canada)

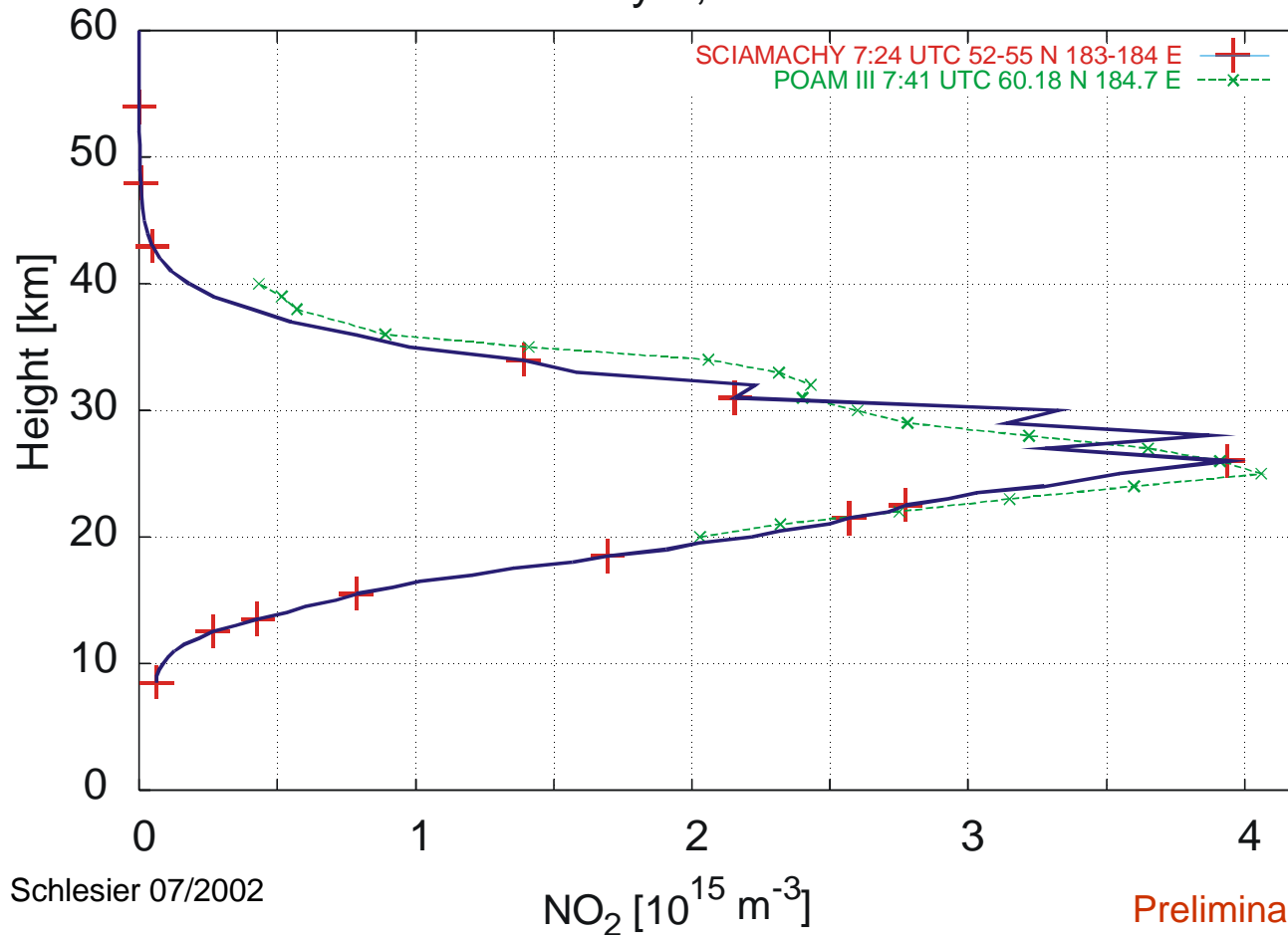
Savigny et al. 08/2002

OCCULTATION MEASUREMENTS



NO₂ Profile from Solar Occultation compared to POAM III

May 6, 2002



J. Meyer & A. Schlesier 07/2002

Preliminary results!

NADIR MEASUREMENTS



Sun



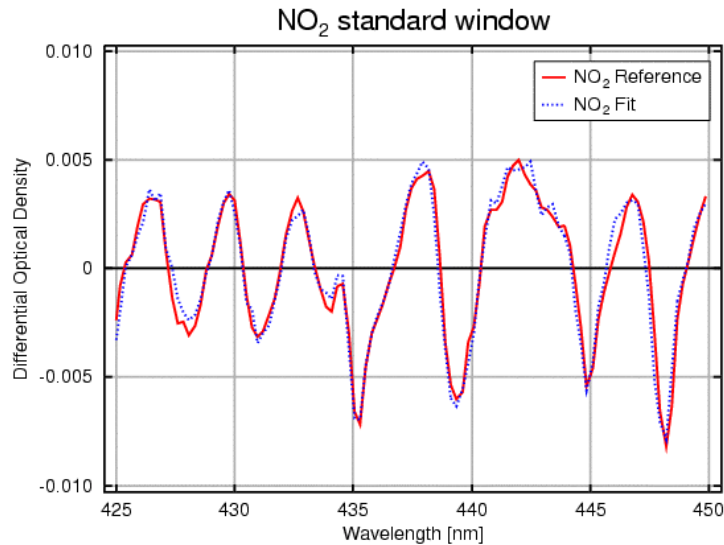
SCIAMACHY



Earth

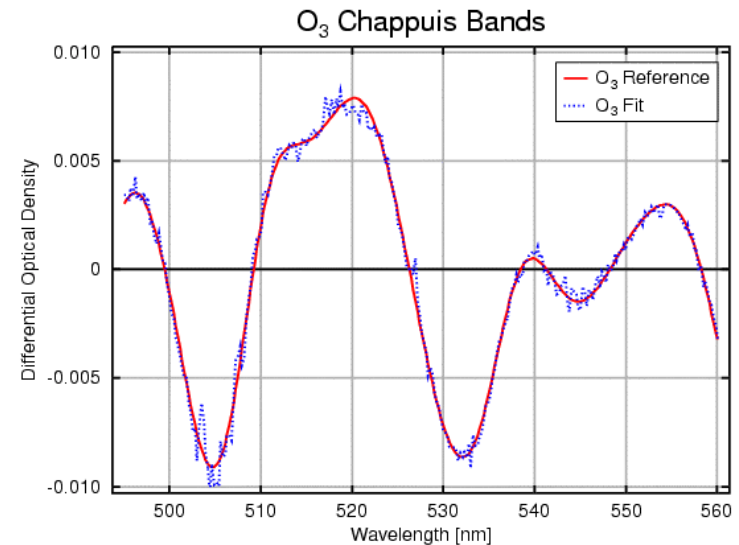
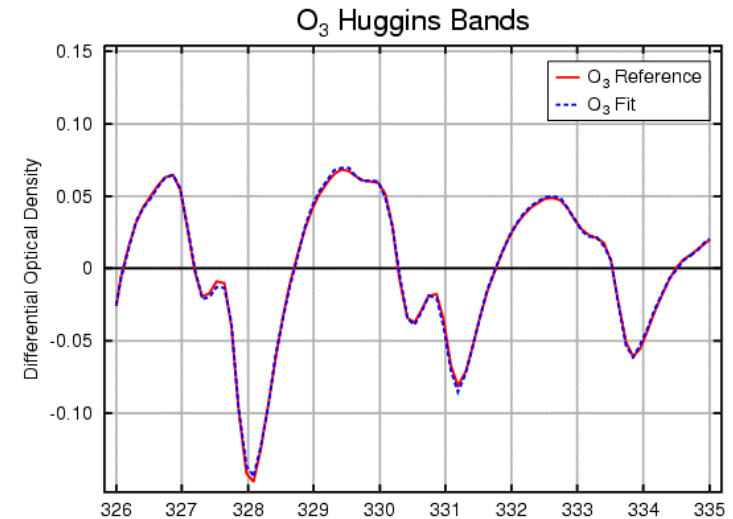


First SCIAMACHY Nadir Spectral Fits

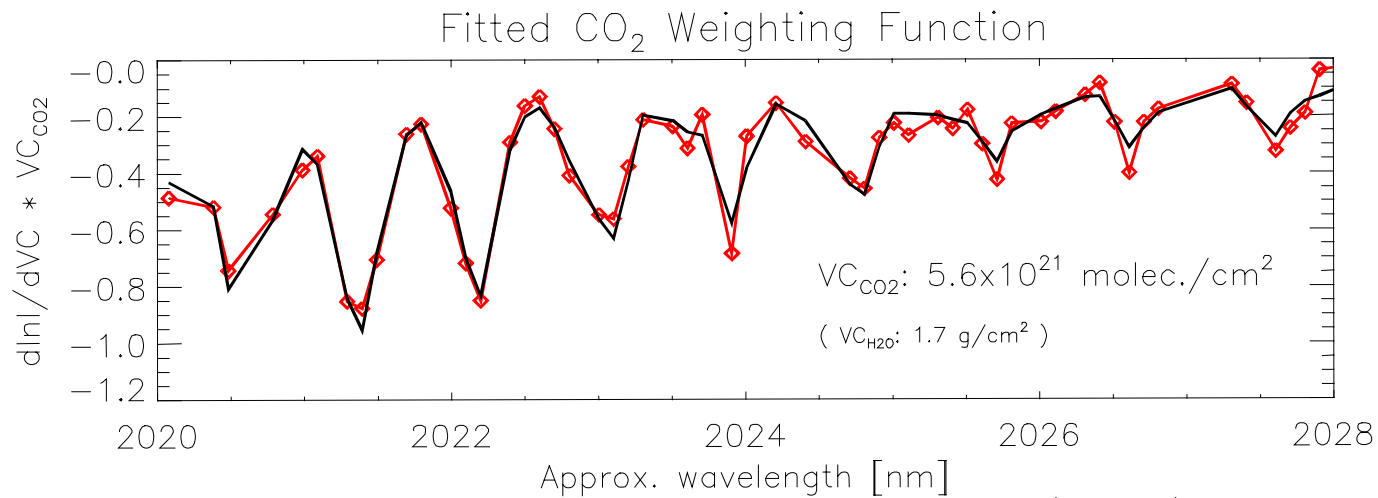
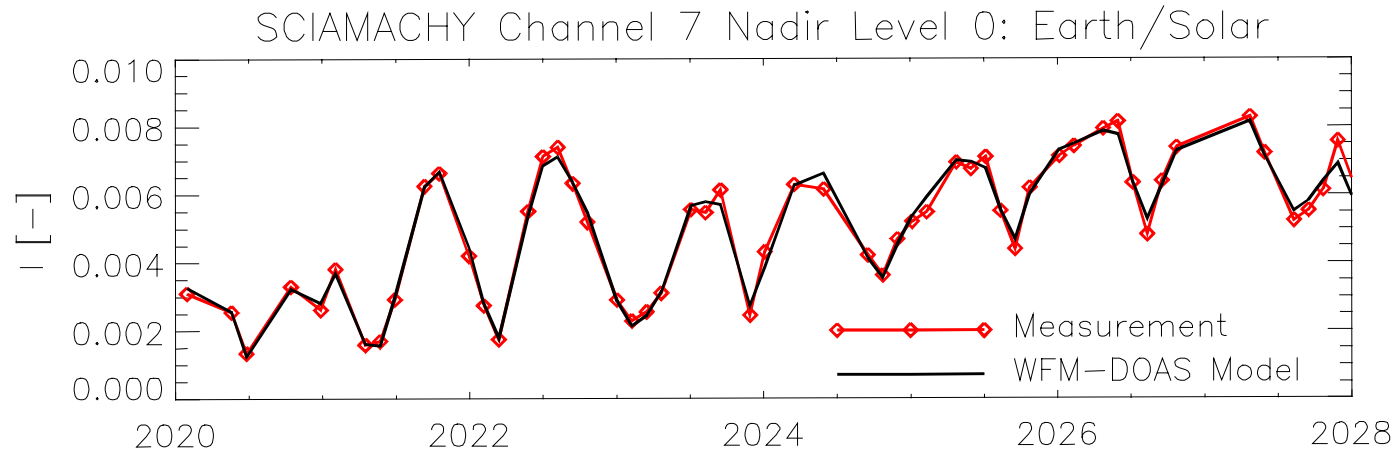


date: 20/06/2002
location: 67.6°N, 20°E
SZA: 80.5°
uncalibrated raw data (lv0)
DOAS analysis using GOME settings

[Richter et al., 07 / 2002](#)

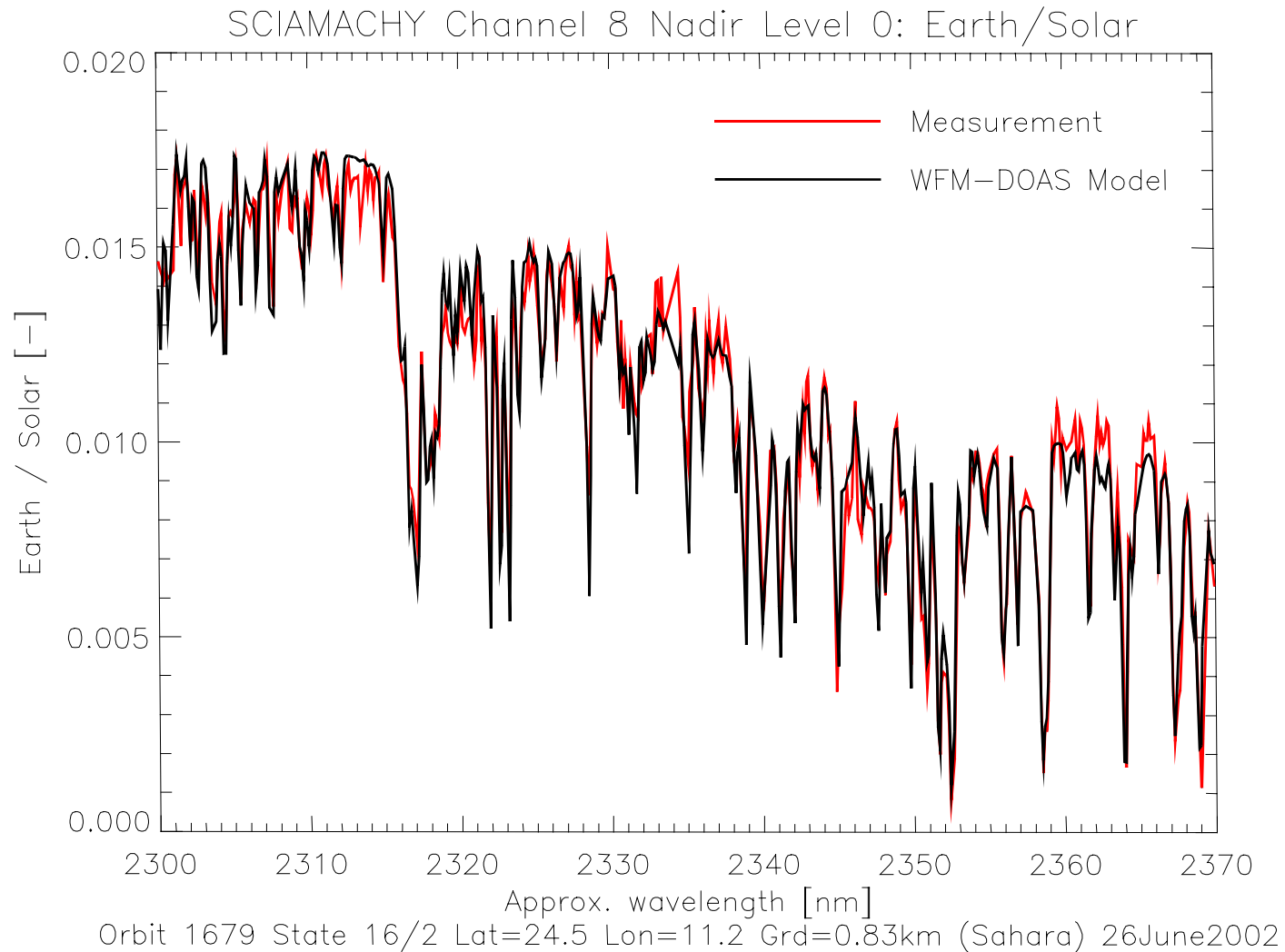


Channel 7: CO₂ & H₂O

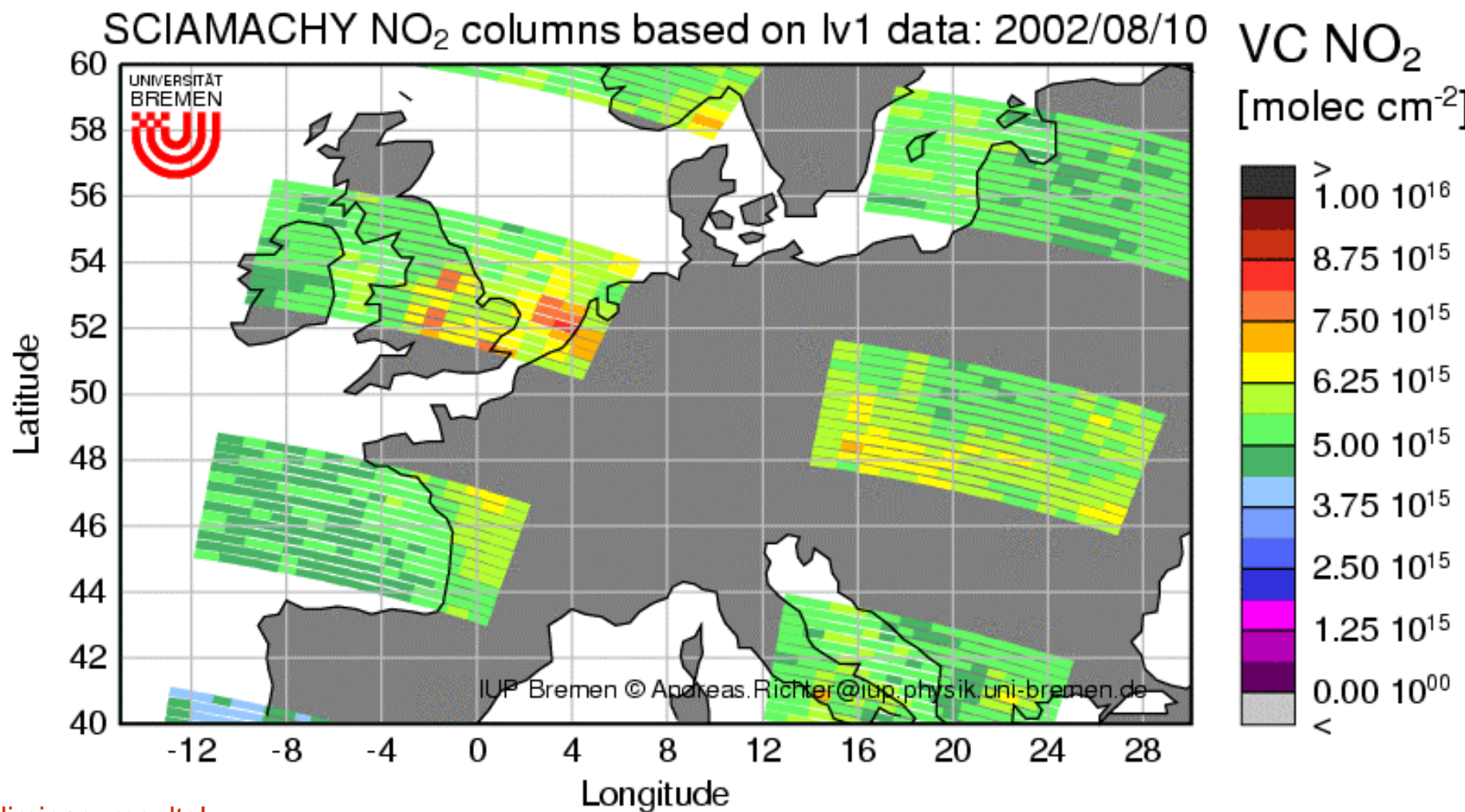


Approx. wavelength [nm]
Orbit 1679 State 16/2 Lat=24.5 Lon=11.2 Grd=0.83km (Sahara) 26June2002

Channel 8

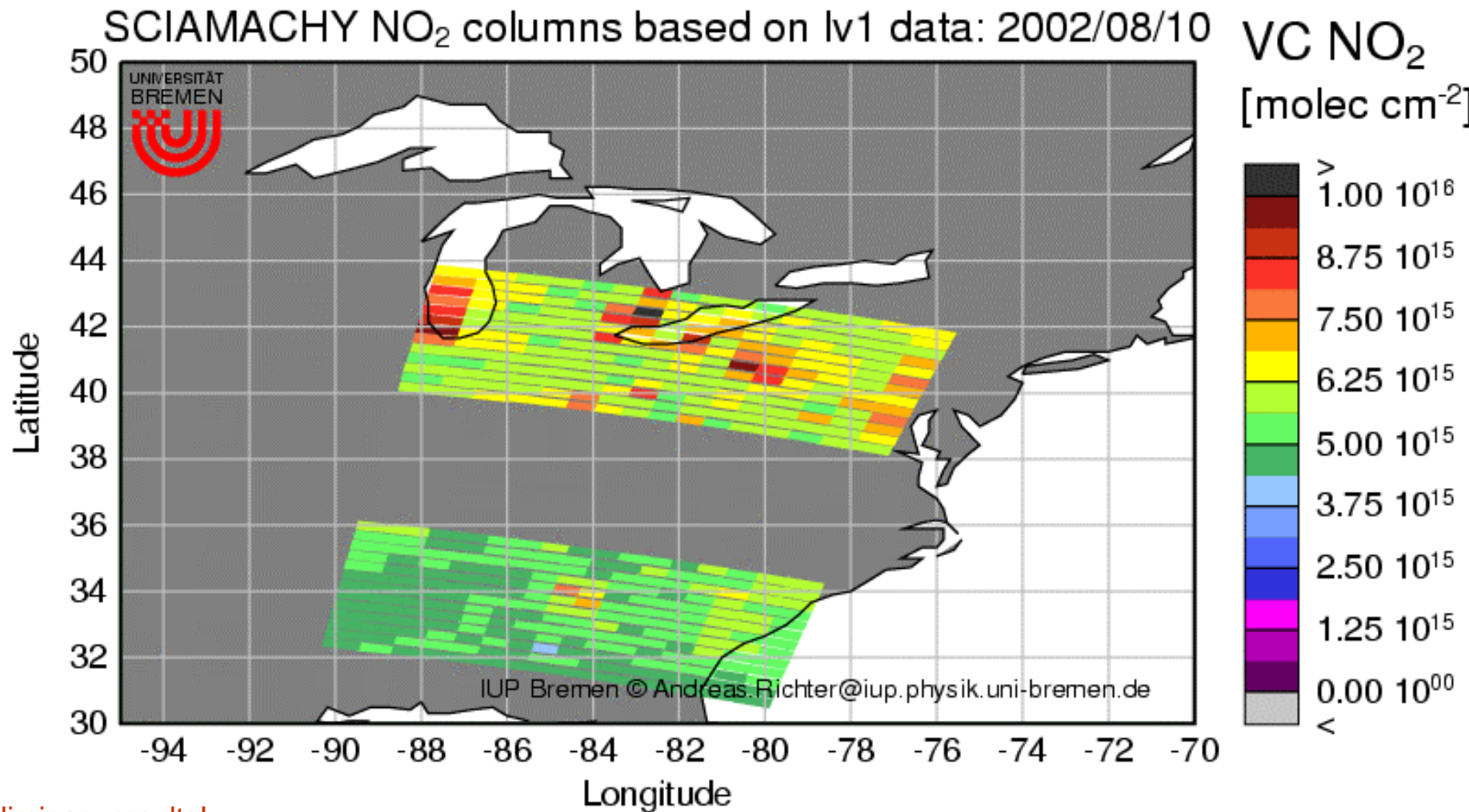


SCIAMACHY Nadir NO₂ over Europe



Preliminary results!

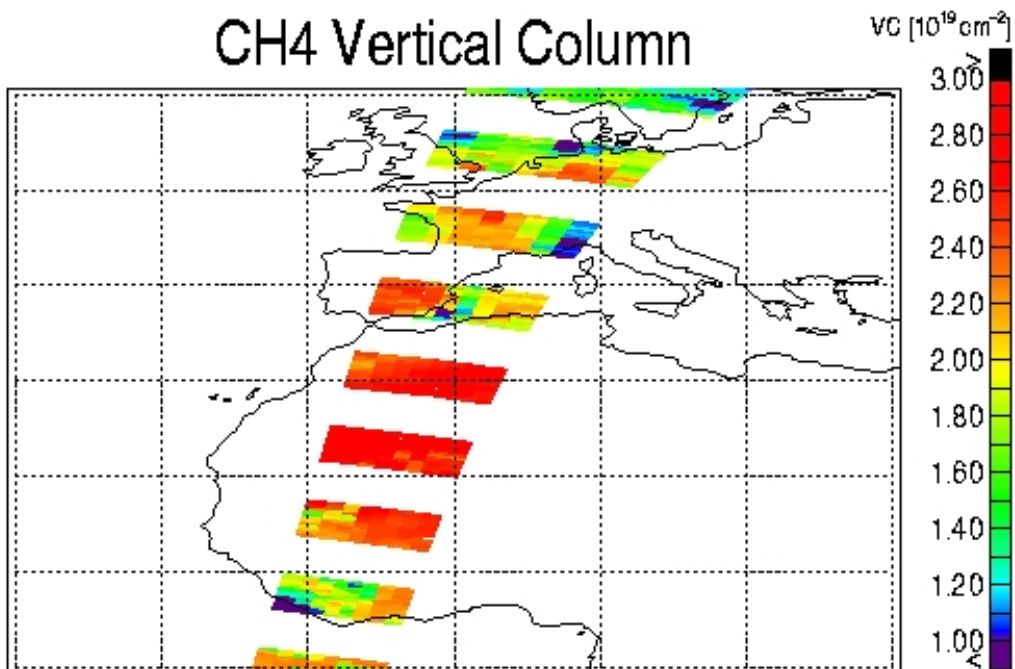
SCIAMACHY Nadir NO₂ over US



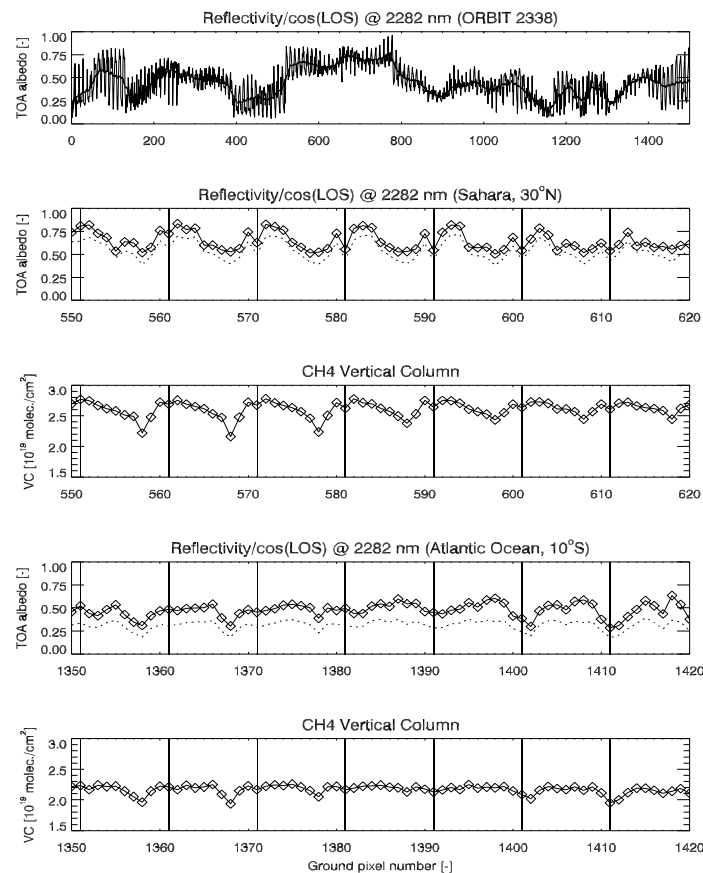
Preliminary results!

WFM-DOAS Derived Methane Columns

CH₄ Vertical Column



Buchwitz et al. 08/2002



Preliminary results!

Conclusion

- SCIAMACHY is delivering very exciting data!
- These preliminary results gives confidence that SCIAMACHY is in good shape.
- We can expect a high data quality after validation and optimisation of the operational data products.