

Highlights of SCIAMACHY

5th German SCIAMACHY Validation Team (GSVT)
Meeting, Dec 7th, 2004, Bremen

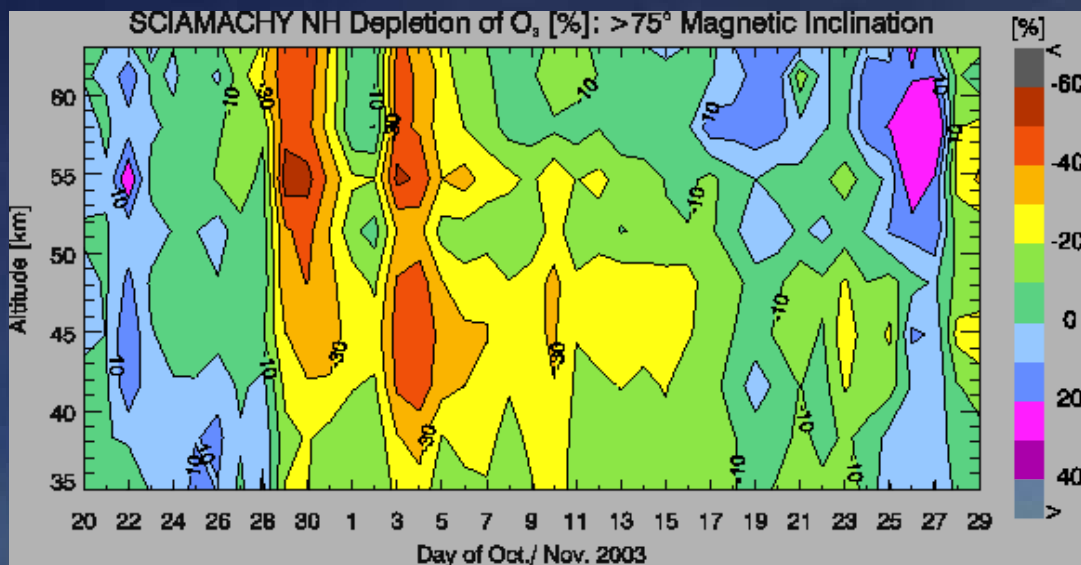


Mesospheric O₃ & SPEs - Observations vs. Model

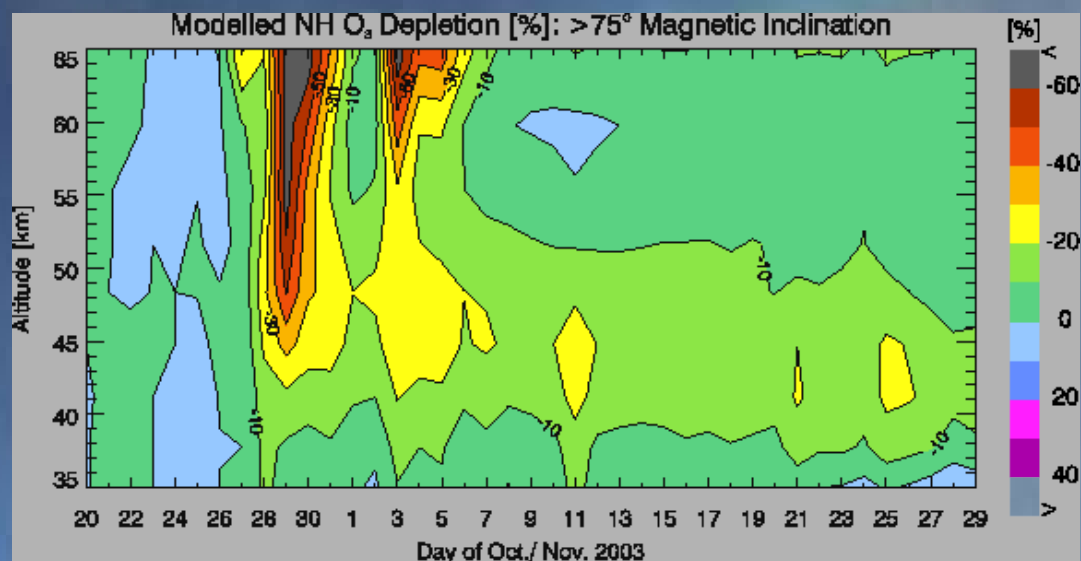
Percent ozone loss north of 60° N magnetic latitude

SCIAMACHY
Measurements
(G. Rohen)

Reference period:
October 20–24, 2003



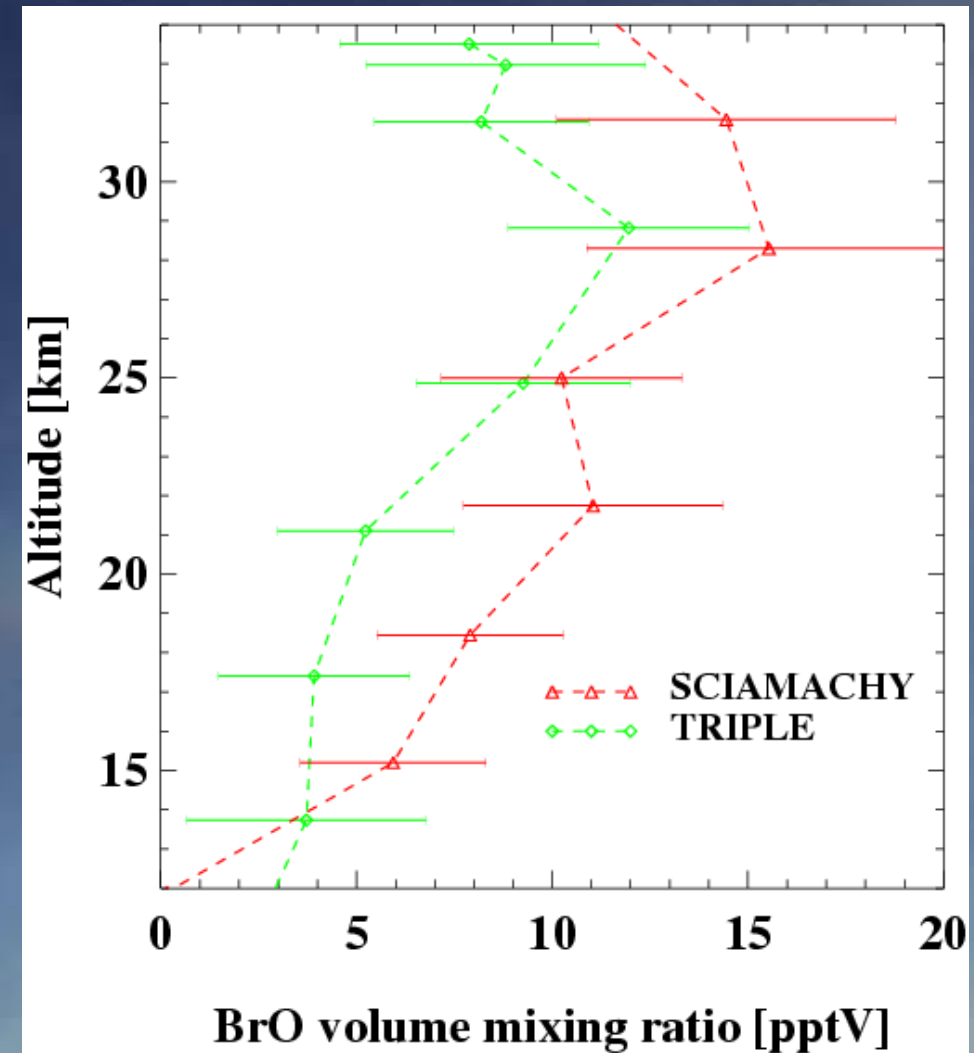
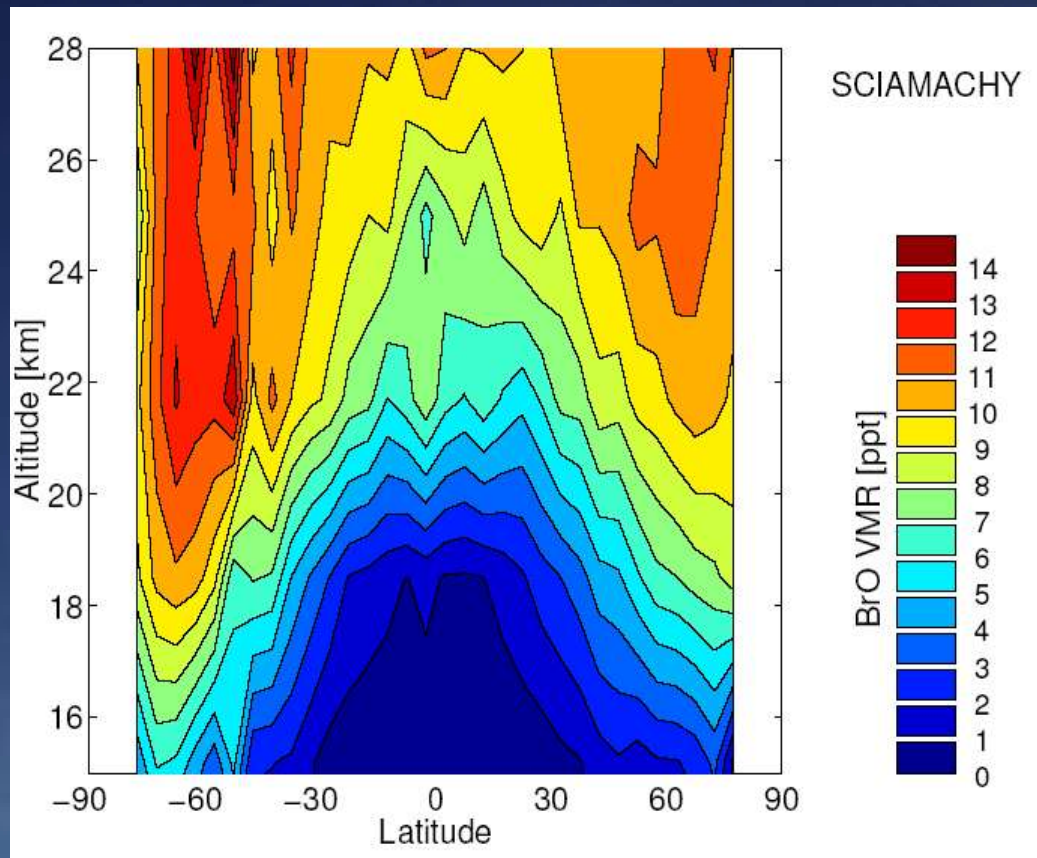
Model simulations
(M. Sinnhuber)



First global stratospheric BrO profile data set

Zonal Average September 2002

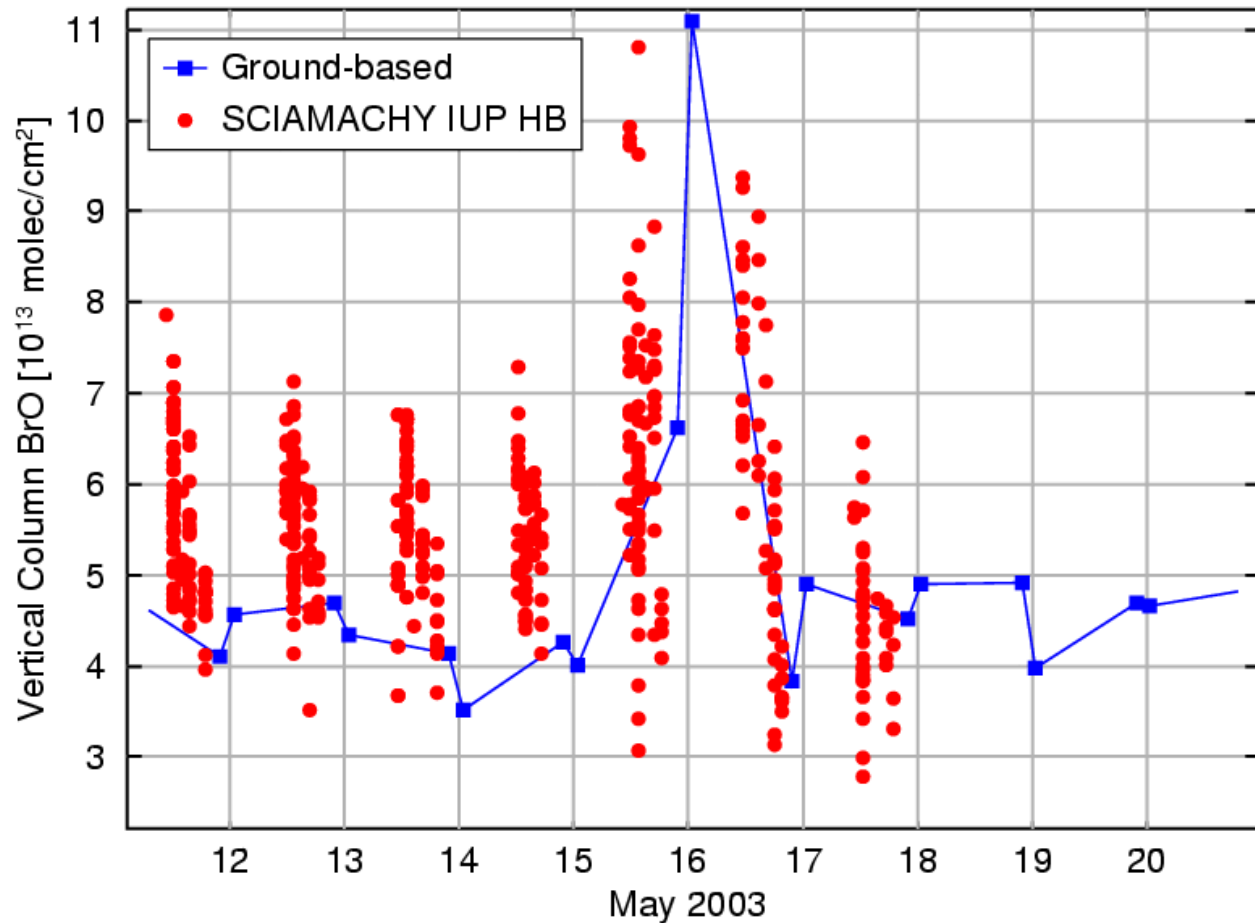
September 24, 2002 (43°N, 0°E)



TRIPLE Balloon: FZ Jülich – SCIAMACHY BrO: IFE/IUP

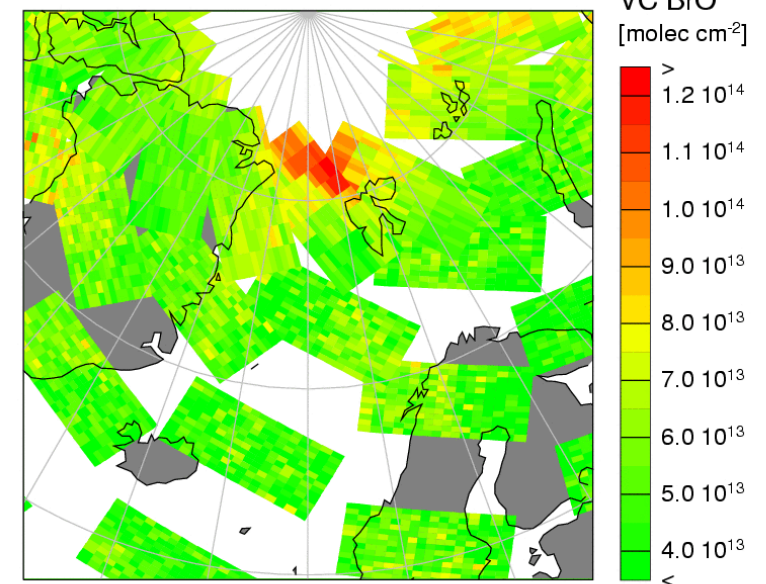
BrO event close to Spitzbergen

DOAS and SCIAMACHY BrO in Ny-Ålesund



- BrO event seen both by ground-based DOAS and SCIAMACHY
- values agree qualitatively
- scatter in SCIAMACHY BrO

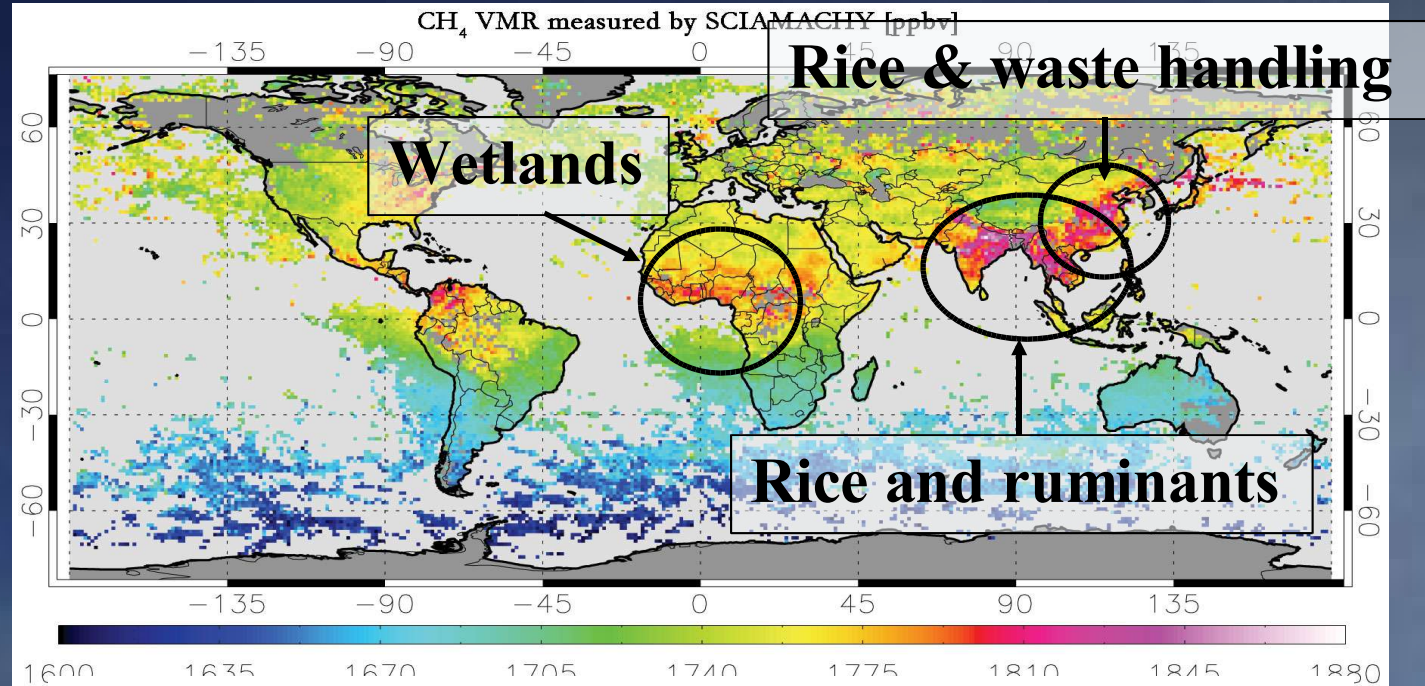
SCIAMACHY BrO 2003/05/15



A. Richter

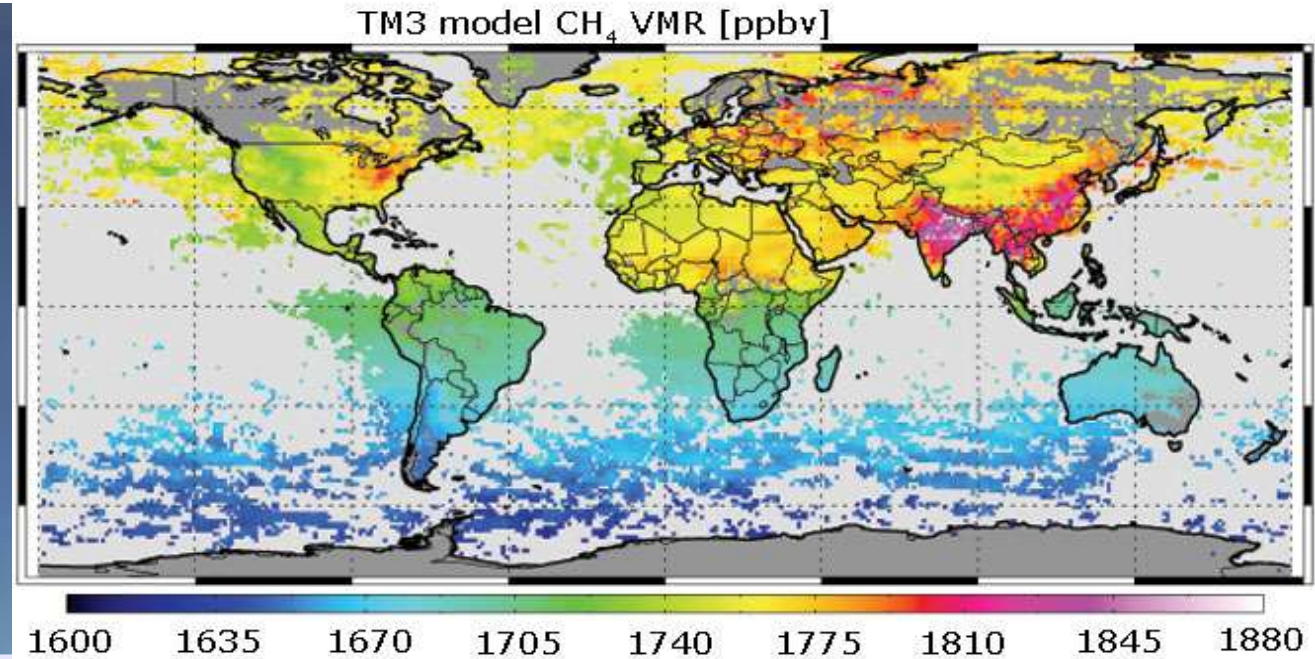
CH₄ Sources & Sinks - Comparison with model results

SCIAMACHY
Aug-Nov 2003

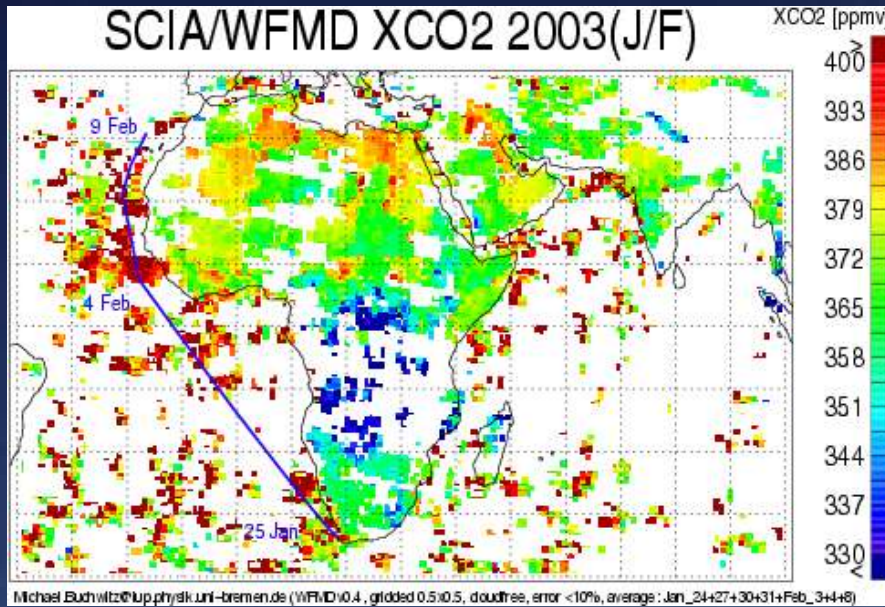


C. Frankenberg, IUP Heidelberg
J.F. Meirink, KNMI, Utrecht

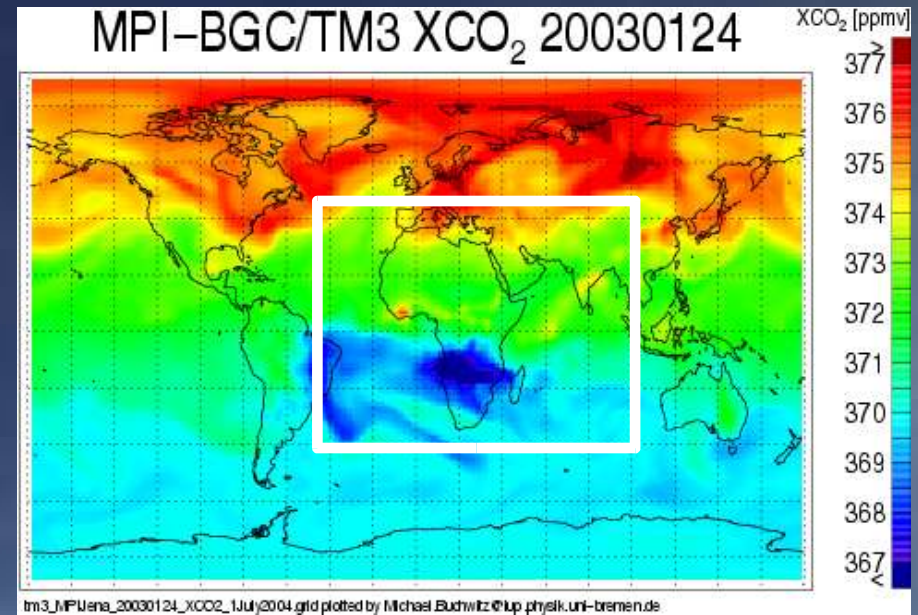
TM3 KNMI
Aug-Nov 2003



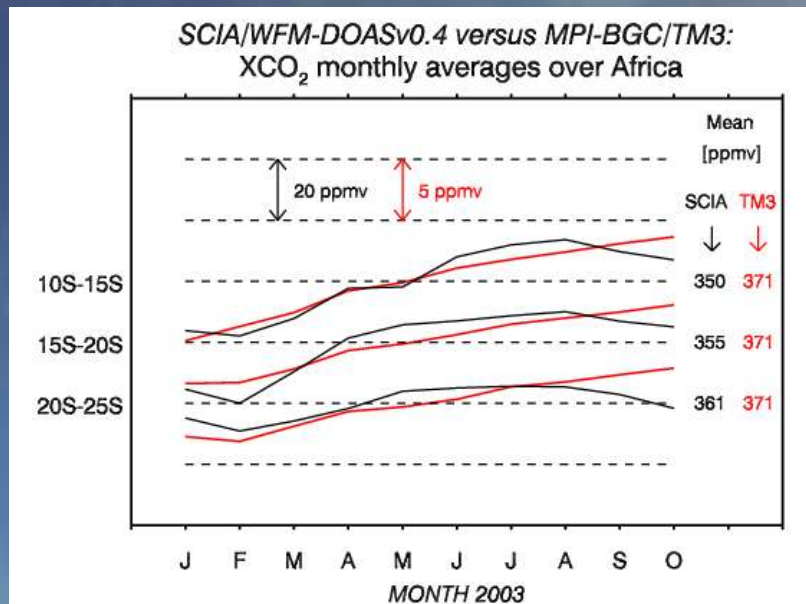
CO₂ Sinks & Sources- Comparison with model results



Buchwitz et al., ACPD, 2004

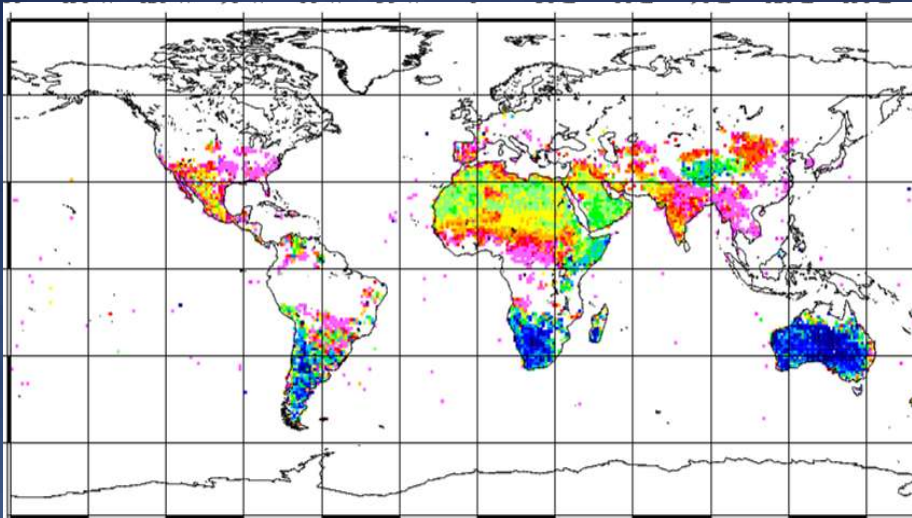


TM3 data: S. Körner, MPI-BGC, Jena



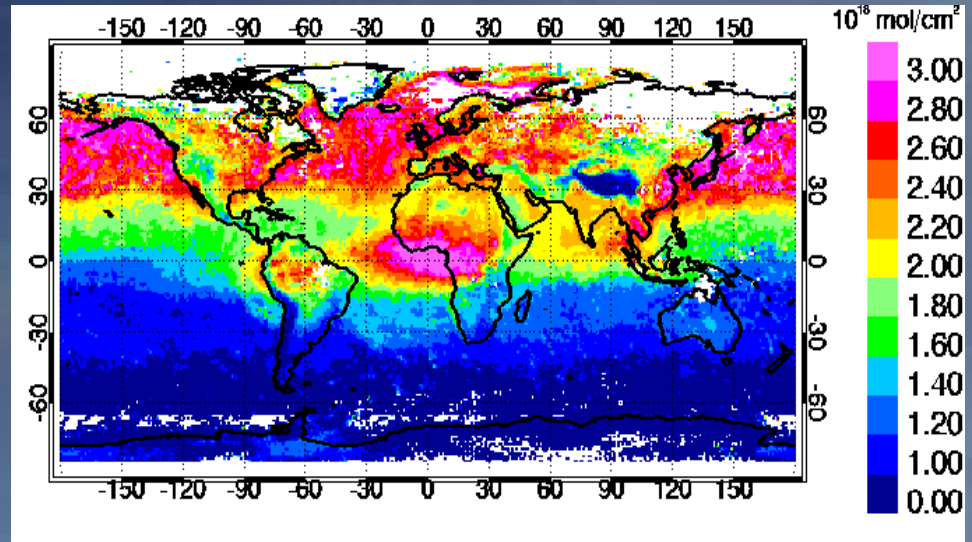
SCIAMACHY vs. MOPITT total CO columns February 2004

SCIAMACHY



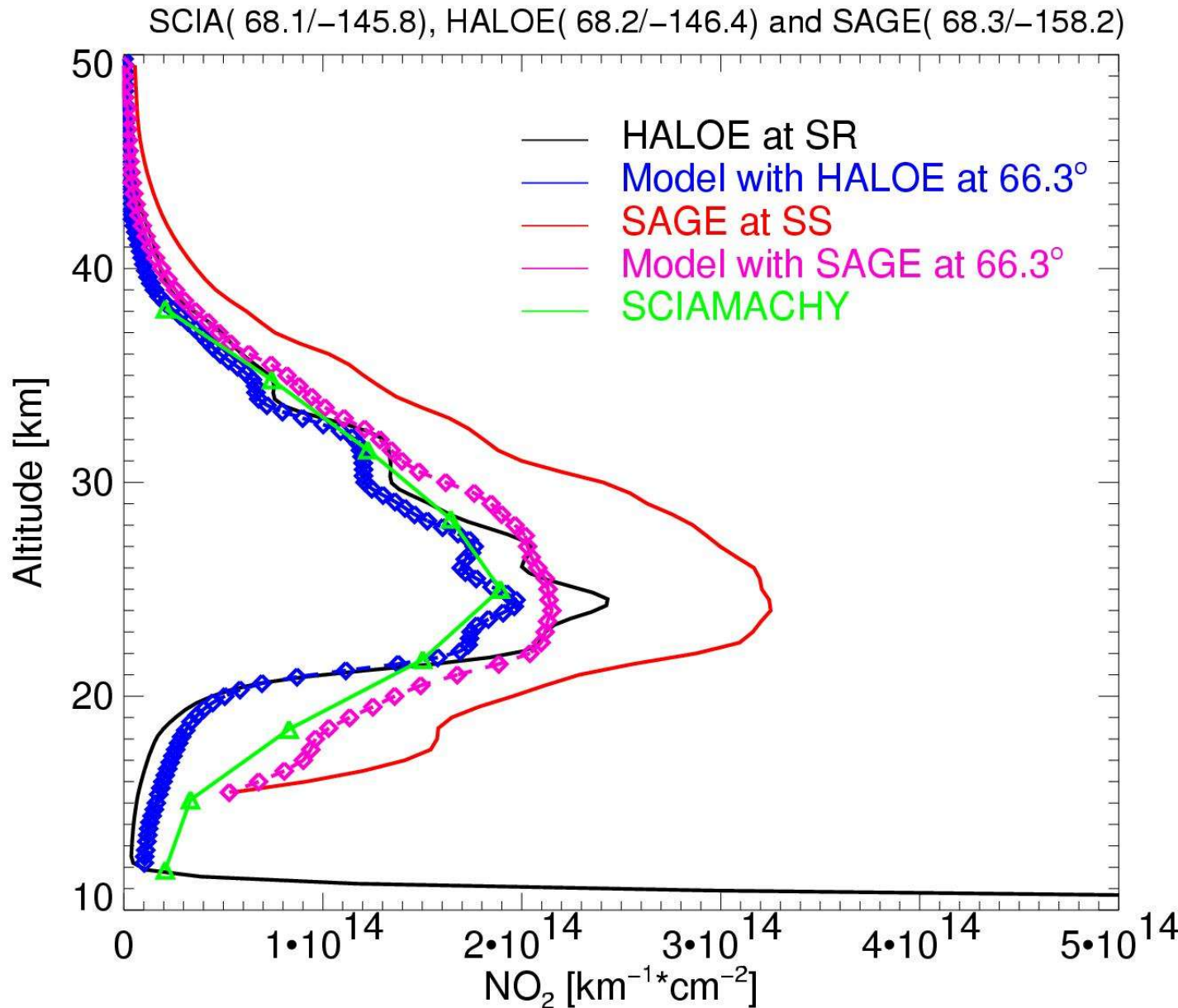
IMLM algorithm, © SRON 2004

MOPITT



© NCAR MOPITT team: www.eos.ucar.edu/mopitt/

Validation of stratospheric NO₂ profiles

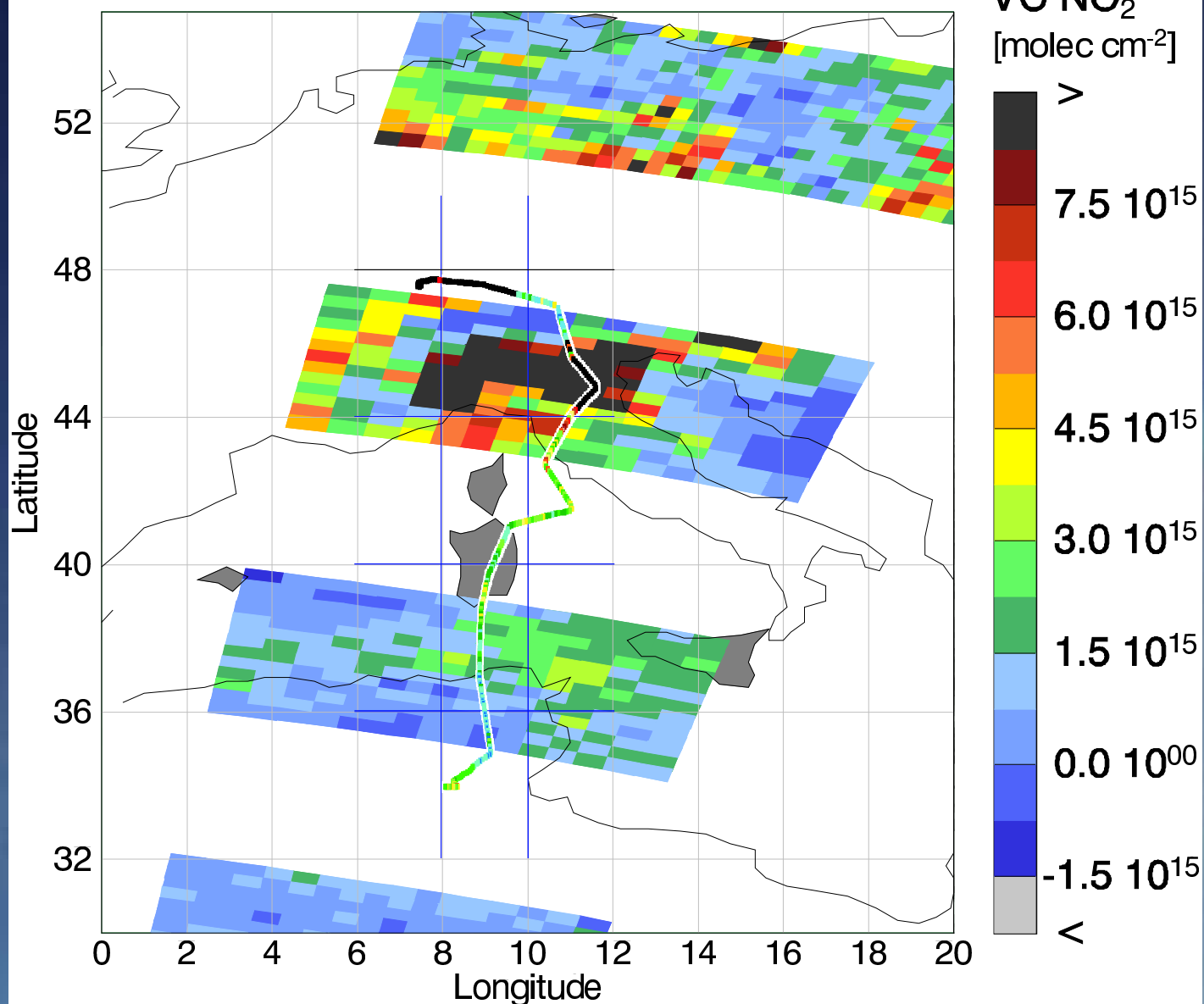


Comparisons of NO₂ profiles from collocated HALOE (black), SAGE (red) and SCIAMACHY (green, IUP Bremen) measurements using a 1-dim chemical model to take the diurnal cycle of NO₂ into account.

A. Bracher

Validation of Tropospheric NO₂

Tropospheric NO₂ from SCIAMACHY and
AMAXDOAS 19/02/2003



Tropospheric vertical NO₂ column measured by AMAXDOAS and SCIAMACHY (IUP Bremen). The AMAXDOAS data were overlaid over SCIAMACHY's pixel in the same scale using similar colours.

Figure: K.P. Heu et al.

Highlights Total and Tropospheric Column Data

- SCIAMACHY yields for the first time global distributions of CO, NO₂, HCHO and SO₂ with a spatial resolution adequate to study air quality from regional to global scales
- Global distributions of H₂O over land and ocean
- The very high sensitivity of tropospheric NO₂ data from SCIAMACHY is demonstrated by the detection of enhanced NO₂ along ship tracks in the Red Sea and the Indian Ocean
- CO from biomass burning is detected unambiguously (California, Africa, Siberia) with a high sensitivity to the lowest troposphere
- GHG CO₂ and CH₄ are detected down to the surface
- Cloud Parameters (cloud top height, optical thickness etc.) are detected in parallel to the trace gas measurements
- Aerosol Optical Thickness over Land and Ocean is progressing

Highlights SCIAMACHY Profiling

- SCIAMACHY yields for the first time global distributions of daytime BrO and NO₂ in the stratosphere from pole-to-pole
- O₃ profiles are covering the lower stratosphere up to the mesosphere
- OCIO is detected under Cl-activation at polar vortex
- NO₃ is detected in the SH during night time with the lunar occultation mode
- PSC and NLC can be routinely detected, their optical parameter can be determined
- The temperature of the mesopause is determined via OH Meinel band emission (3-1) to an accuracy of a least 5 K

SCIAMACHY tropospheric NO₂: June 2003

