

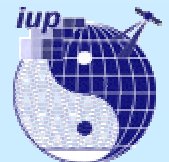


Stratospheric trace gas observations by ASUR during SCIAMACHY validation campaigns

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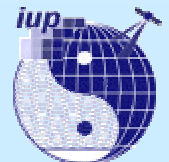
ASUR.....GSVT meeting , 7-8 July 2003 , Bremen





Overview

- ✍ The Instrument
- ✍ Campaigns
- ✍ Data Analyses
- ✍ Validation
- ✍ Summary and Outlook



The Instrument

Technical Features

- Spectral Coverage : 604 - 662 GHz
- Observation Geometry : Up-looking at Zenith angle of 78°
- Acousto-Optical Spectrometer (AOS)
- Chirp Transform Spectrometer (CTS)

Measurement Principle

- ASUR detects thermal emission from rotational lines
- Altitude information comes from pressure broadened lines
- Using Optimal Estimation Method (Rodgers, 78) to retrieve vertical profiles

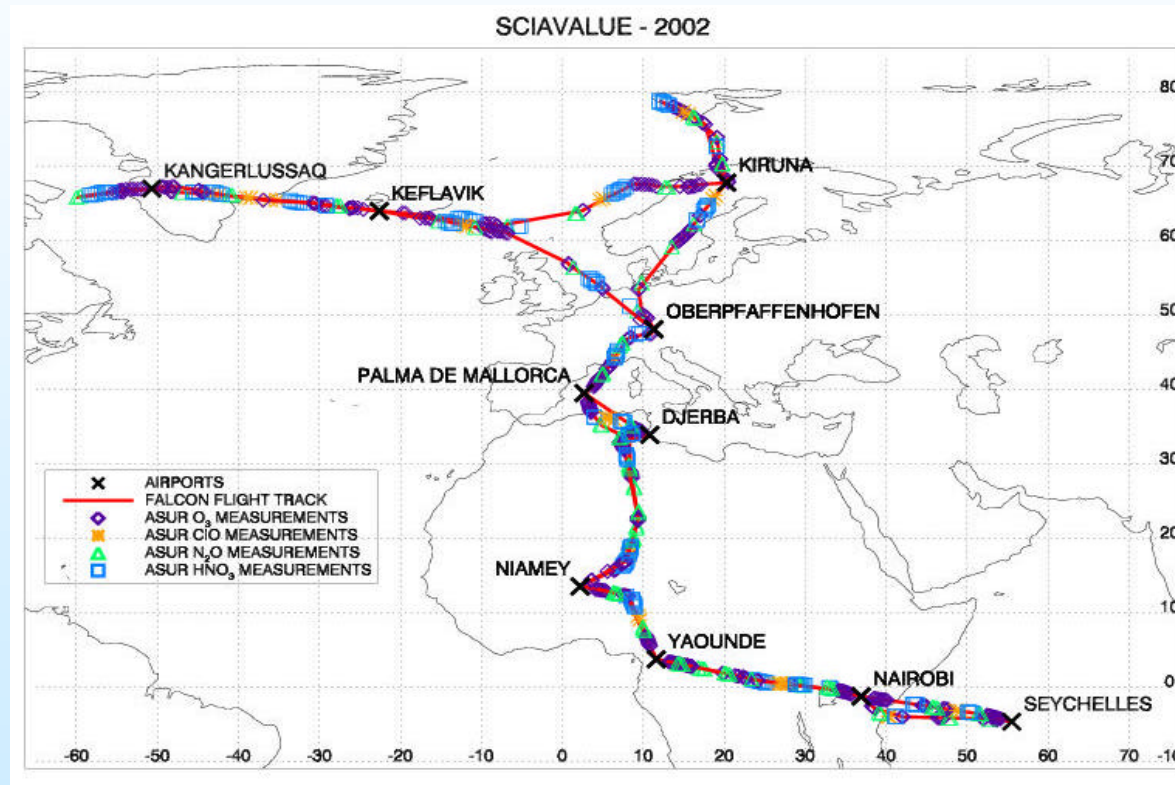
Measurement capability

- Data Products : Vertical profiles of stratospheric molecules
- Species measured : O₃, N₂O, HNO₃, ClO, HCl, H₂O, BrO, NO, HOCl, HO₂, HCN, CH₃Cl, etc..
- Horizontal resolution : 12 - 40 km
- Vertical resolution : 05 -12 km

Measurement information

- Ozone : 15 - 50 km
- N₂O, HCl, HNO₃ : 15 - 40 km

Campaigns

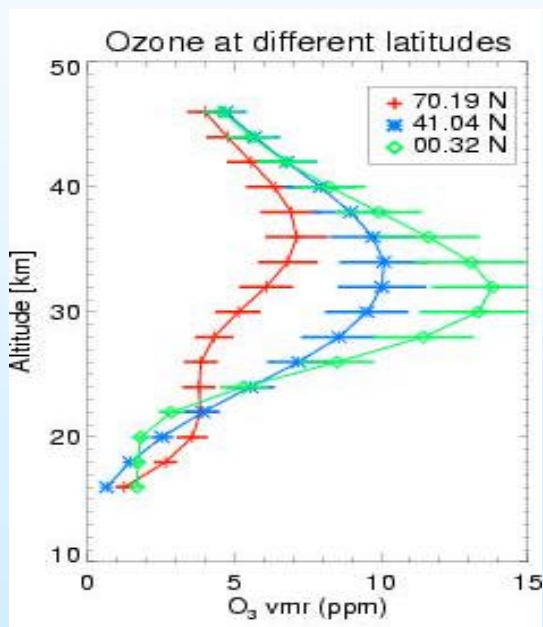


Measured on all but two flights in September 2002 and February/March 2003

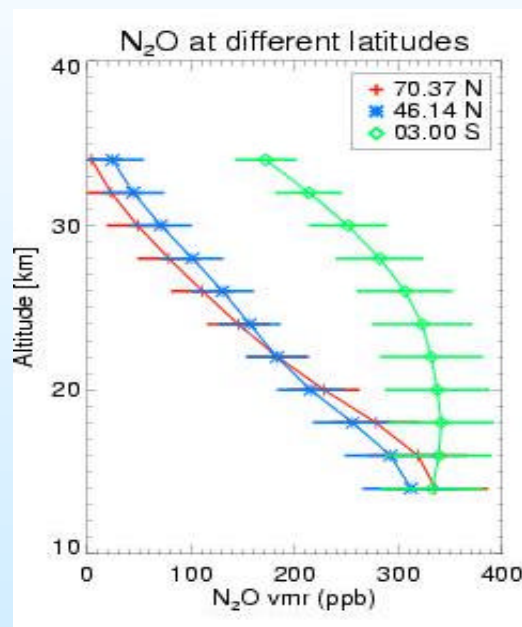
- ≈ 650 Ozone measurements
- ≈ 240 N₂O measurements
- ≈ 250 HNO₃ measurements
- ≈ 650 HCl measurements
- ≈ 80 ClO measurements
- ≈ 23 CH₃Cl measurements

Analyses

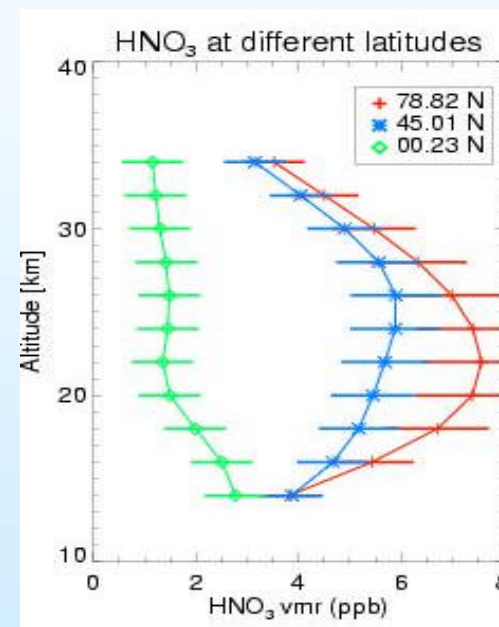
examples of single measurements at **high**, **mid**, and **low** latitudes



O₃

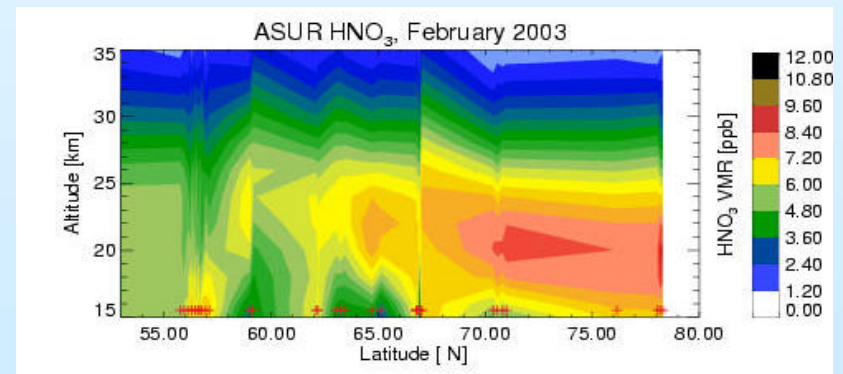
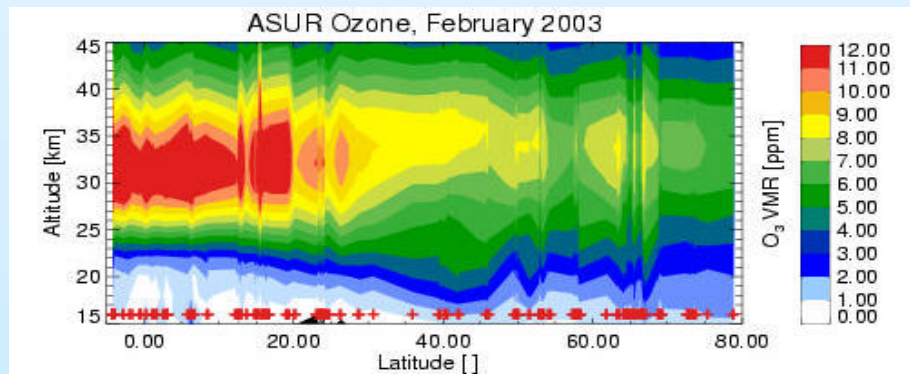
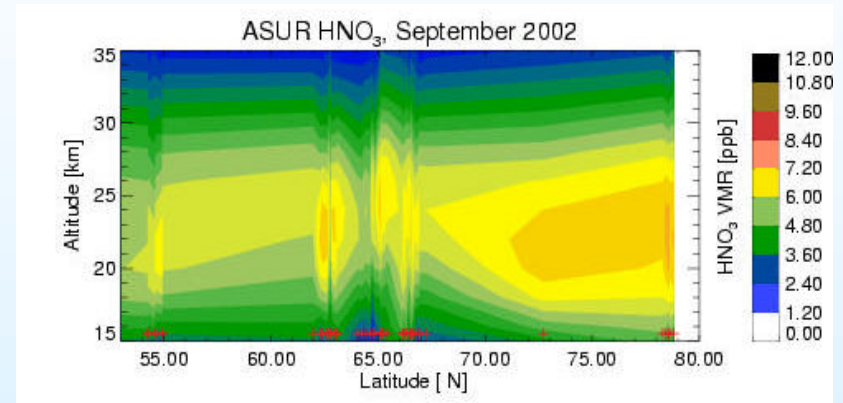
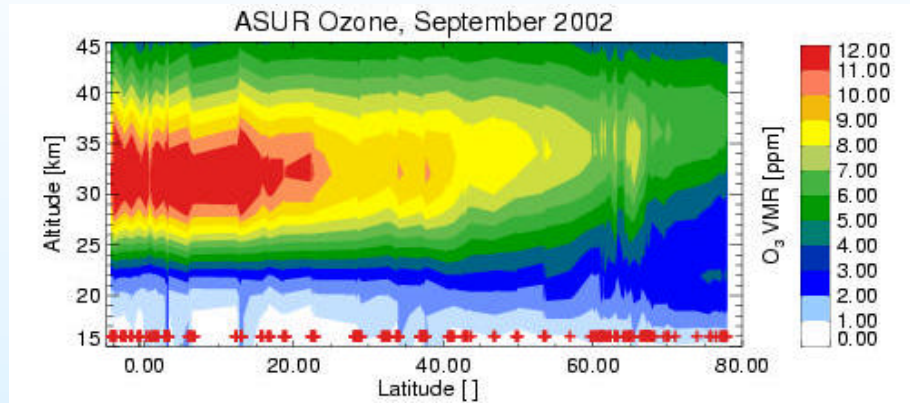


N₂O

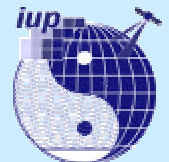
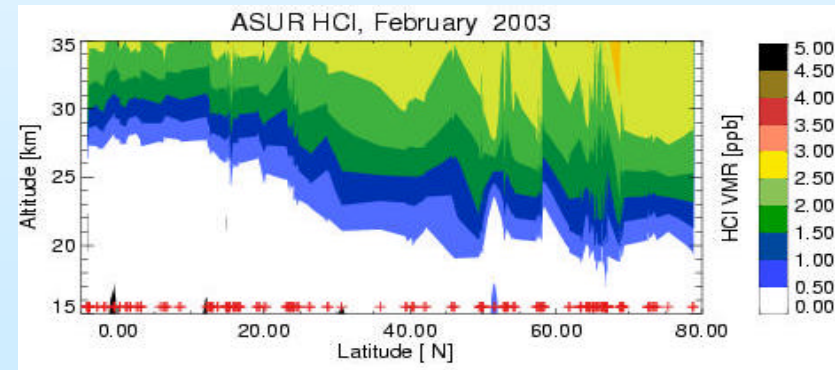
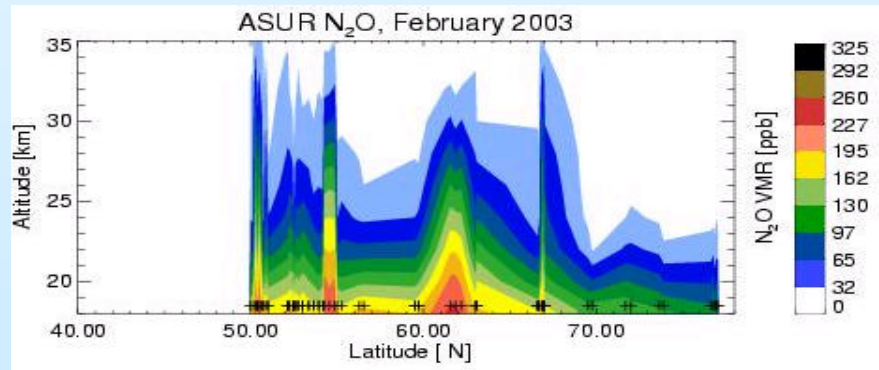
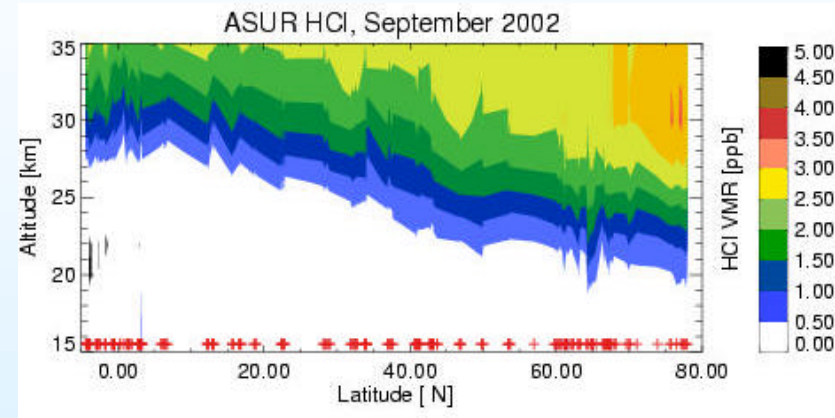
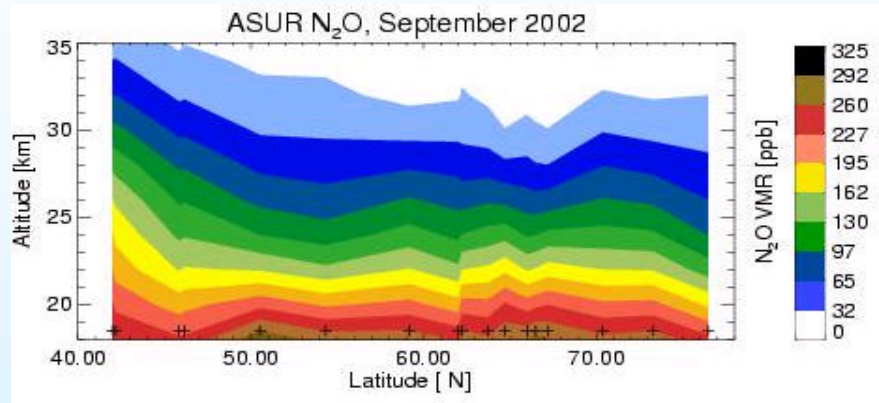


HNO₃

Analyses



Analyses



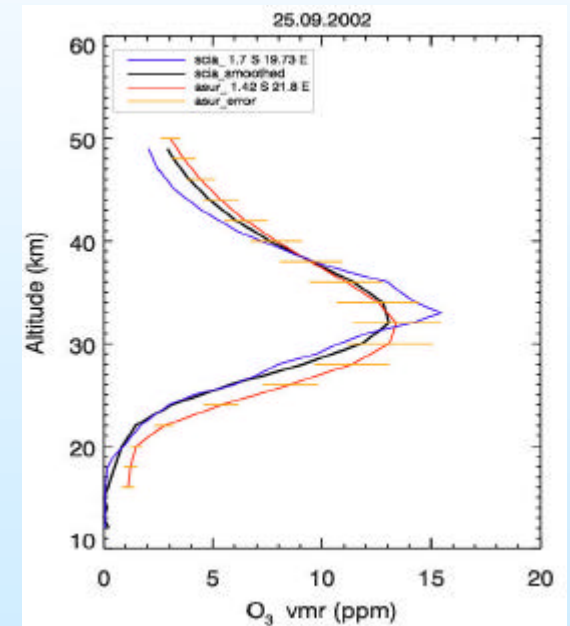
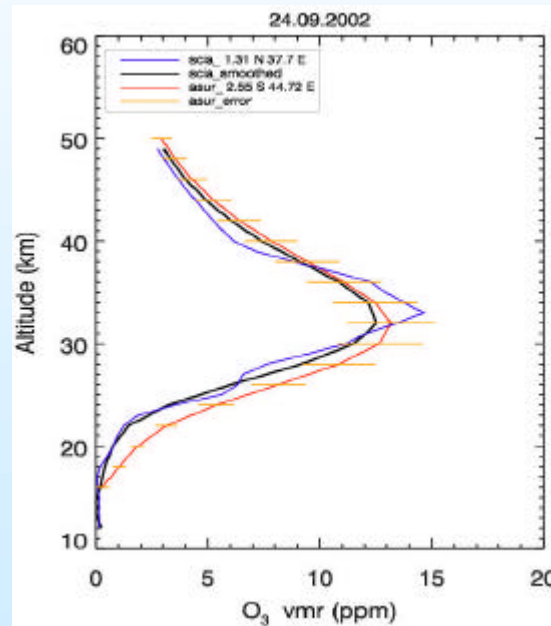
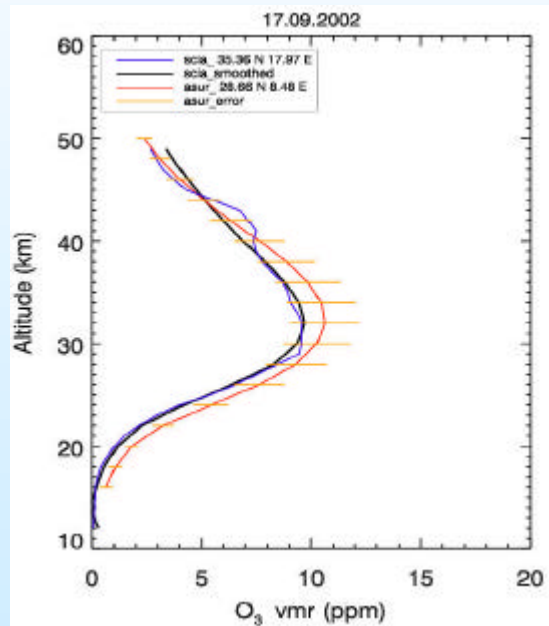
Validation

Comparison with SCIAMACHY O₃ preliminary data

Mediterranean

Central Africa

Indian Ocean



Summary and Outlook

1. ASUR took part in SCIAMACHY validation campaigns and measured a range of stratospheric molecules during all flights, except two flights in February 2003 on southern route.

2. Status

Standard Products : O_3 , N_2O , ClO , HNO_3 , HCl (Good data quality, already been analyzed)

Other Molecules of interest : H_2O , NO , BrO , CH_3Cl , HO_2 , HCN (Spectral quality is good)

SCIAMACHY Products

MIPAS Products

3. Future Plans

Re-evaluation of tropical N_2O and HNO_3

Analyses of other molecules of interest

Comparison with SCIAMACHY profiles (operational in 2004)

Comparison with other instruments (e.g. MIPAS, GOMOS, ODIN)

Validation (in corporation with other groups)

Publication of results

