



SCIAMACHY VALIDATION USING AIRBORNE SUBMILLIMETER RADIOMETER (ASUR) OBSERVATIONS

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Aircraft campaigns

The ASUR sensor

Data analyses and status

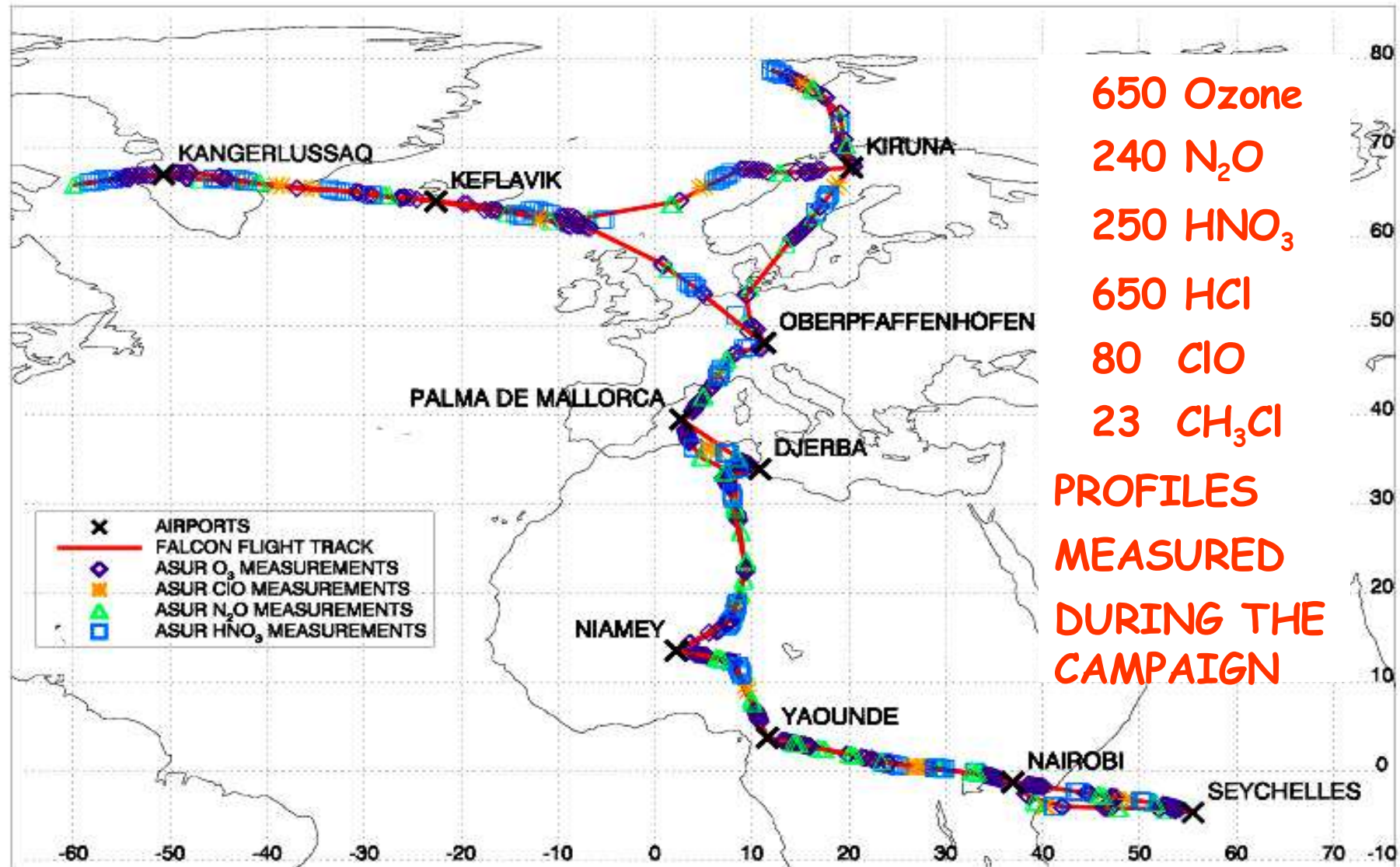
Validation activities

Summary



Campaigns

SCIAVALUE - 2002





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 line shapes

Using Optimal Estimation Method (Rodgers, 1978) to retrieve vertical profiles

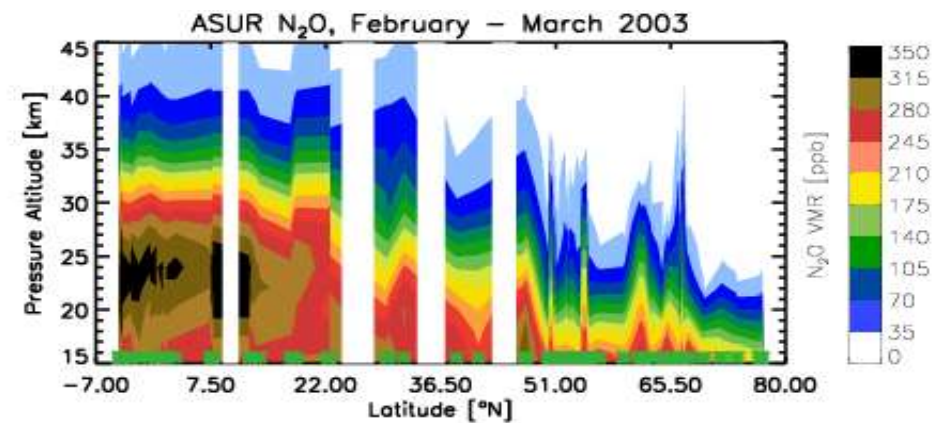
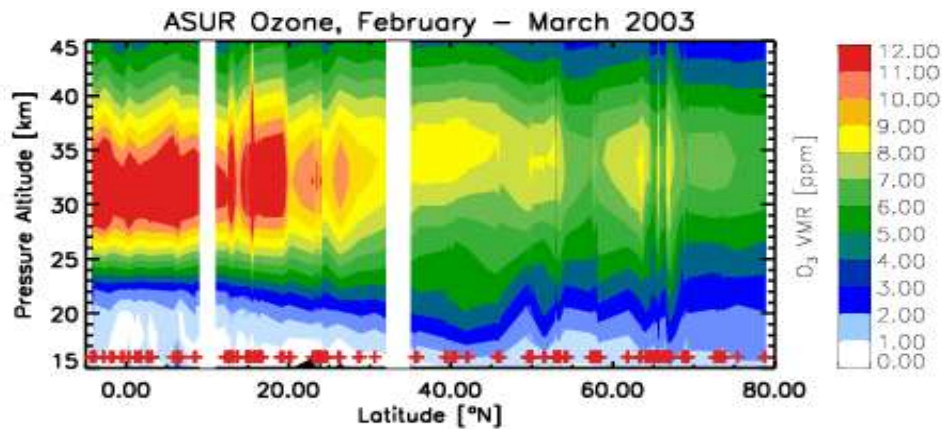
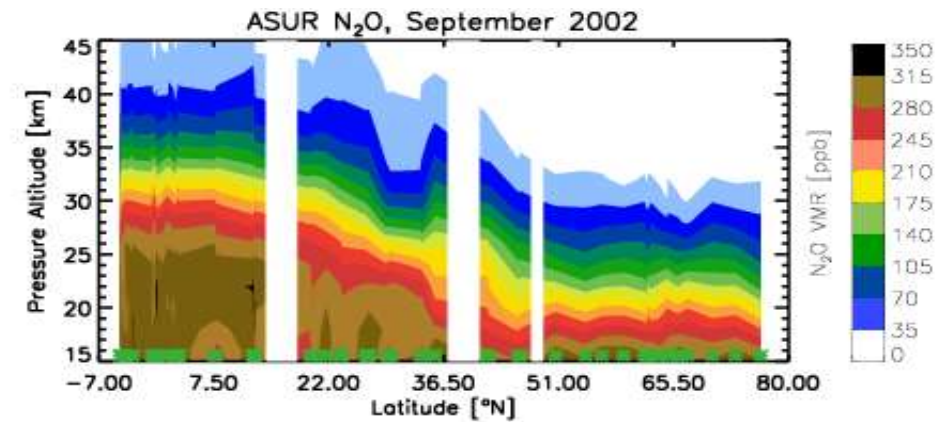
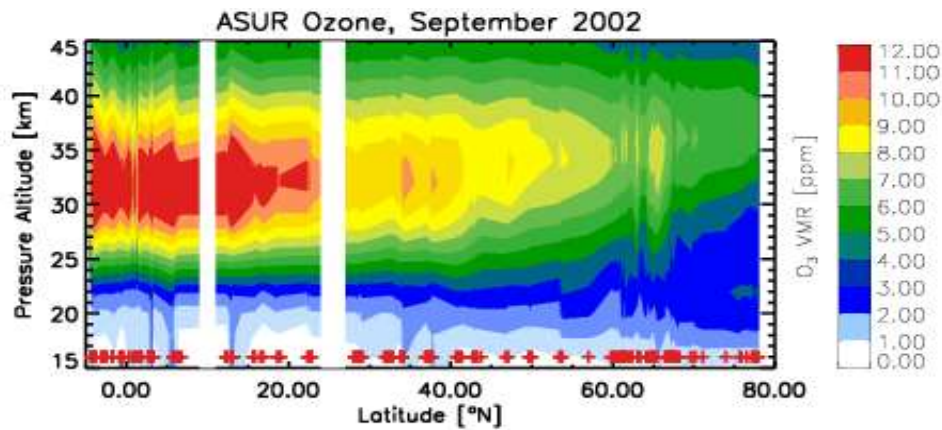


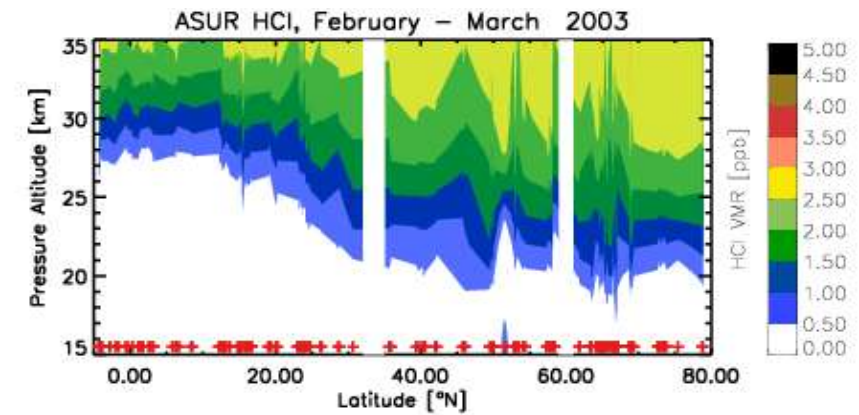
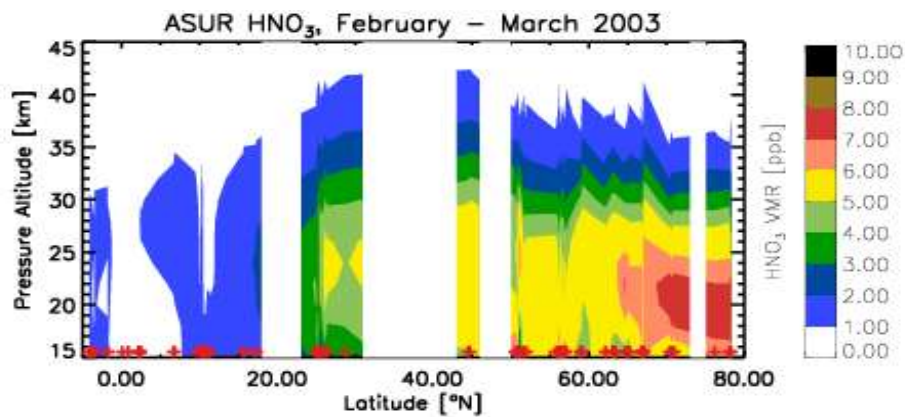
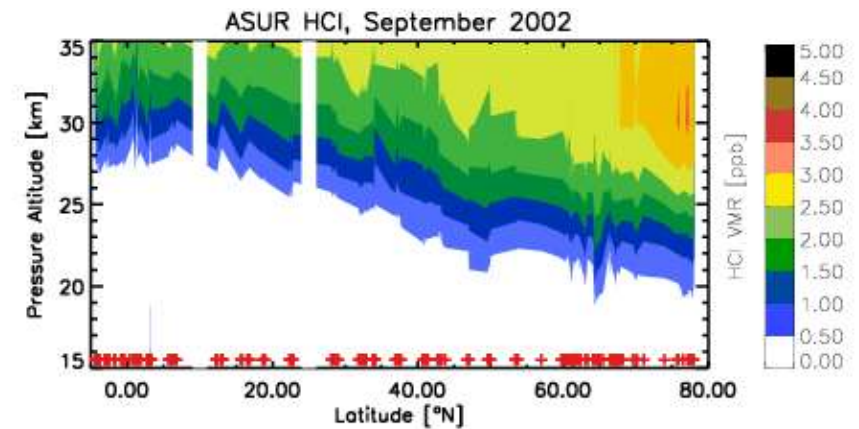
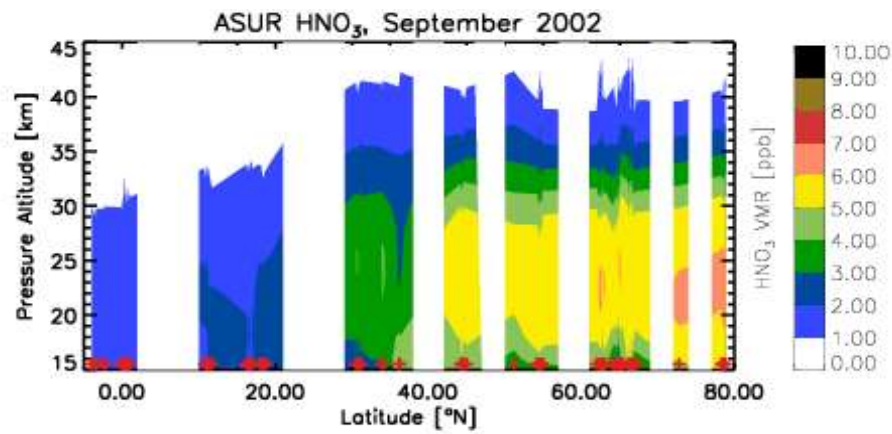
Measurement capability

- Data Products : Vertical profiles of stratospheric molecules
- Species measured : O_3 , N_2O , HNO_3 , ClO , HCl , H_2O , NO ,
 $HOCl$, HO_2 , HCN , CH_3Cl .
- Horizontal resolution : 12 - 40 km
- Vertical resolution : 6 - 15 km

Measurement information_

- Ozone : 15 - 50 km
- N_2O , HCl , HNO_3 : 15 - 40 km







Validation and satellite sensor data

1. SCIAMACHY Ozone profile data from IUP/IFE Bremen

retrieval (C. von Savigny, Version 1.6)
and from ESA operational products (version 1.0)

Validation with ESA and IUP data for September 2002
and validation with IUP data for February and March 2003

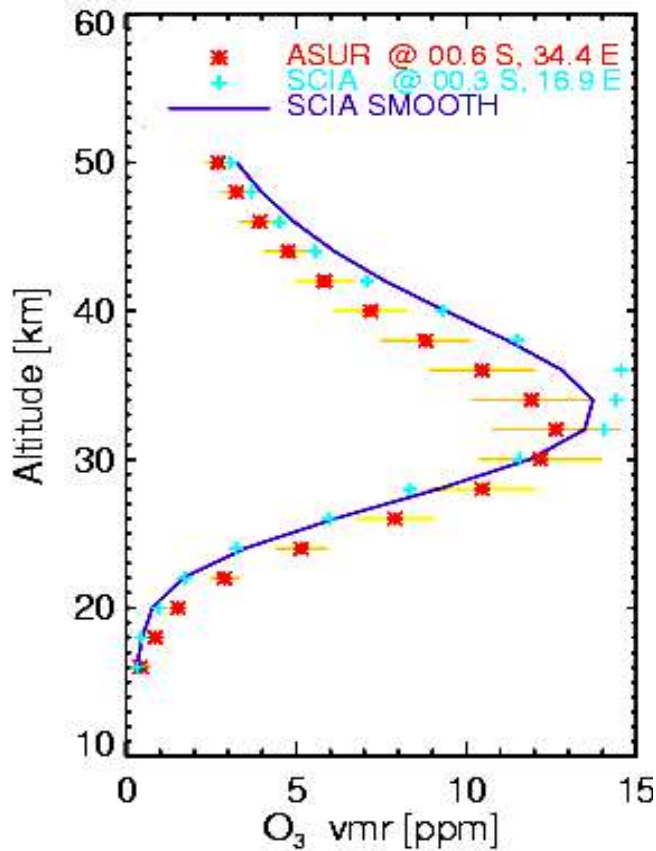
2. MIPAS profiles from IMK retrieval processor (Mathias Milz , version 1.0) and from ESA operational products (IPF version 4.61)

Validation of Ozone, N_2O , HNO_3 , and ClO
Both datasets are validated for
September 2002 and February and March 2003

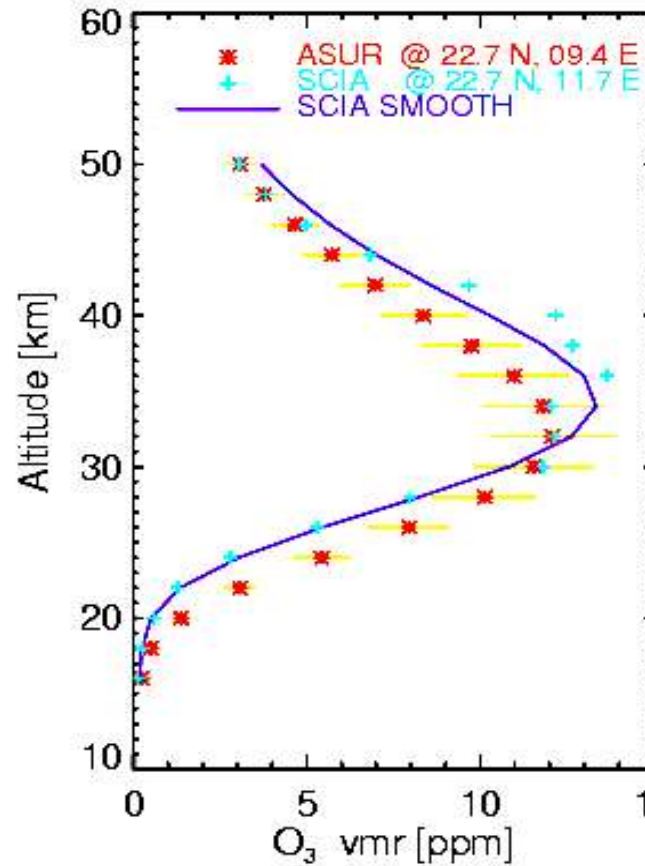


SCIAMACHY ozone validation

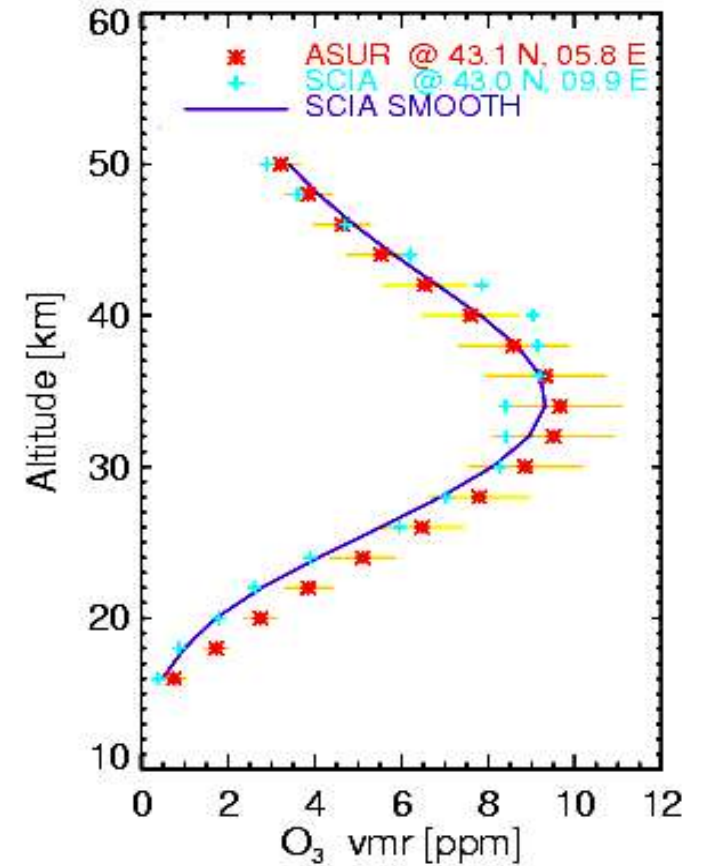
Indian Ocean
25-09-2002



North Africa
26-09-2002

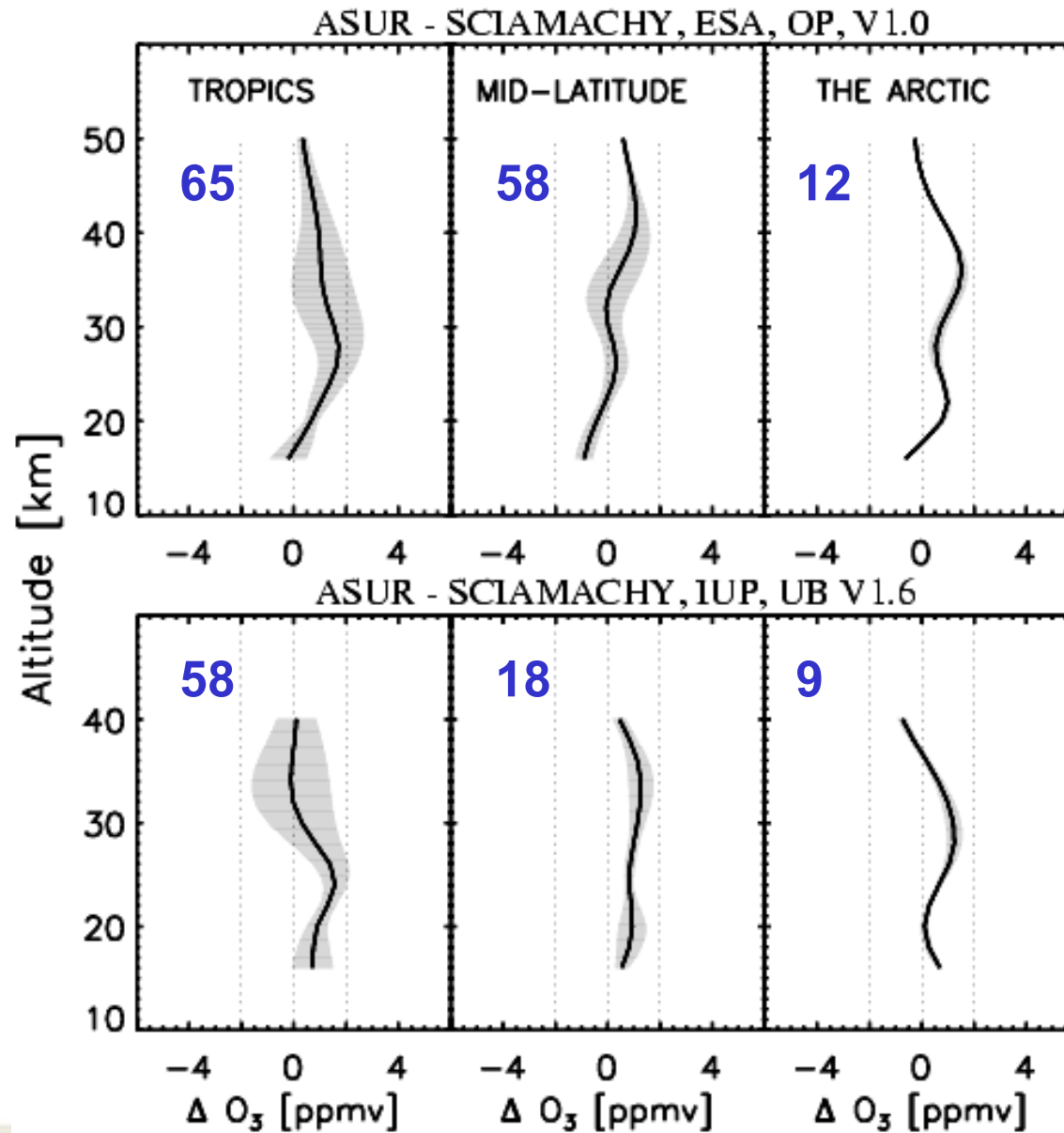


Mediterranean
26-09-2002





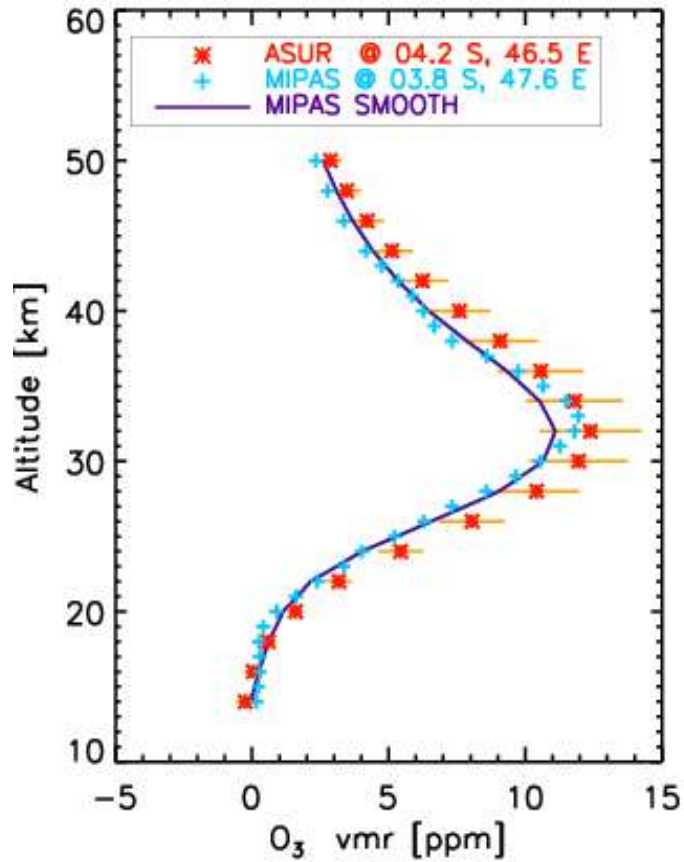
SCIAMACHY ozone validation



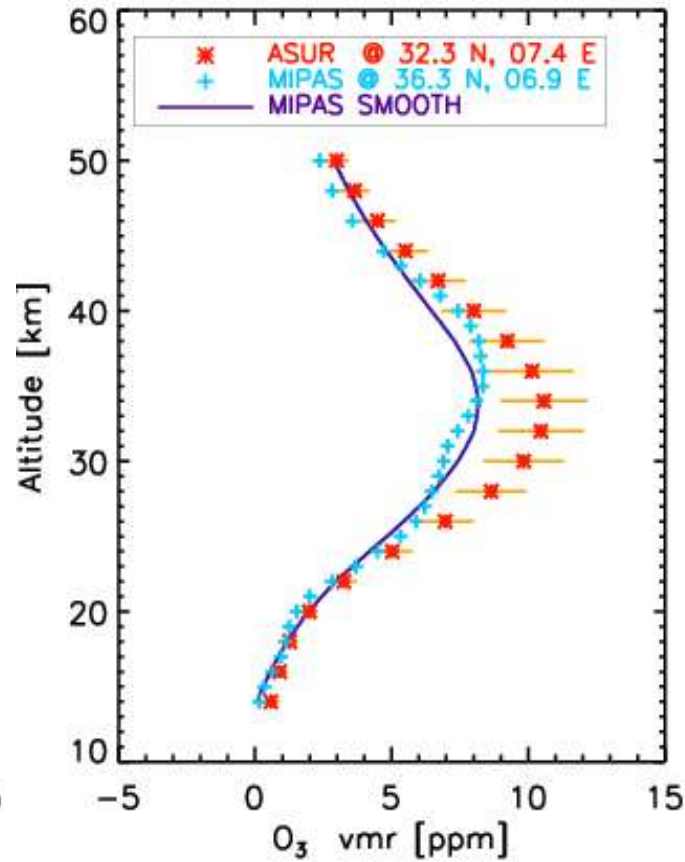


MIPAS ozone validation

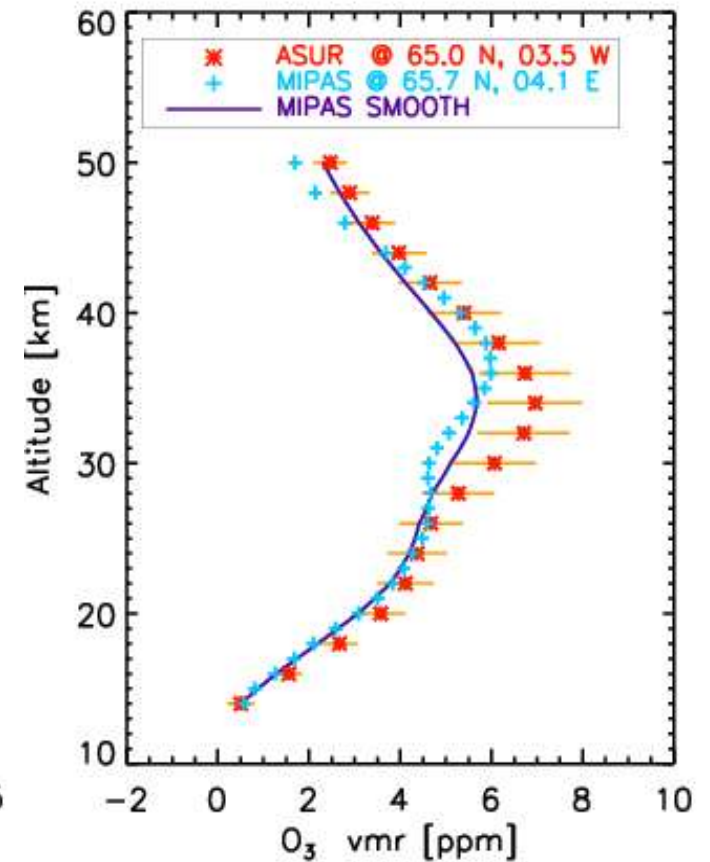
Indian Ocean
19-09-2002



Mediterranean
26-09-2002



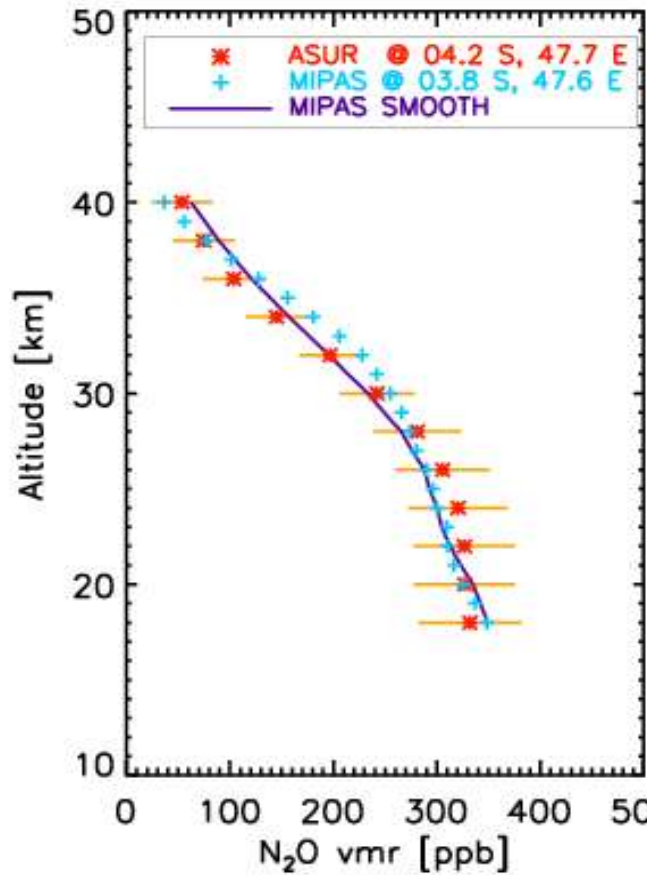
Greenland
13-03-2003



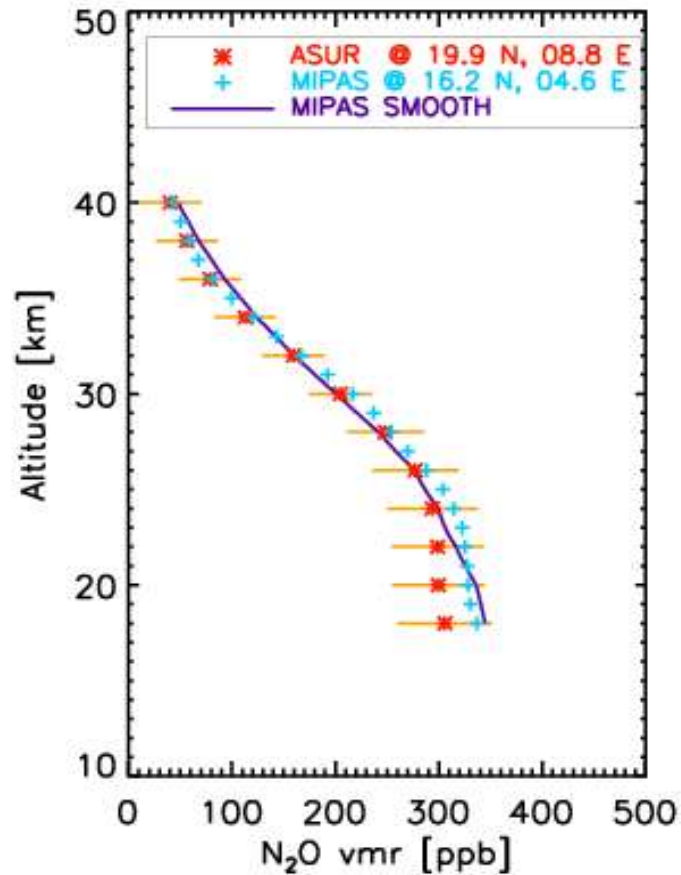


MIPAS N₂O validation

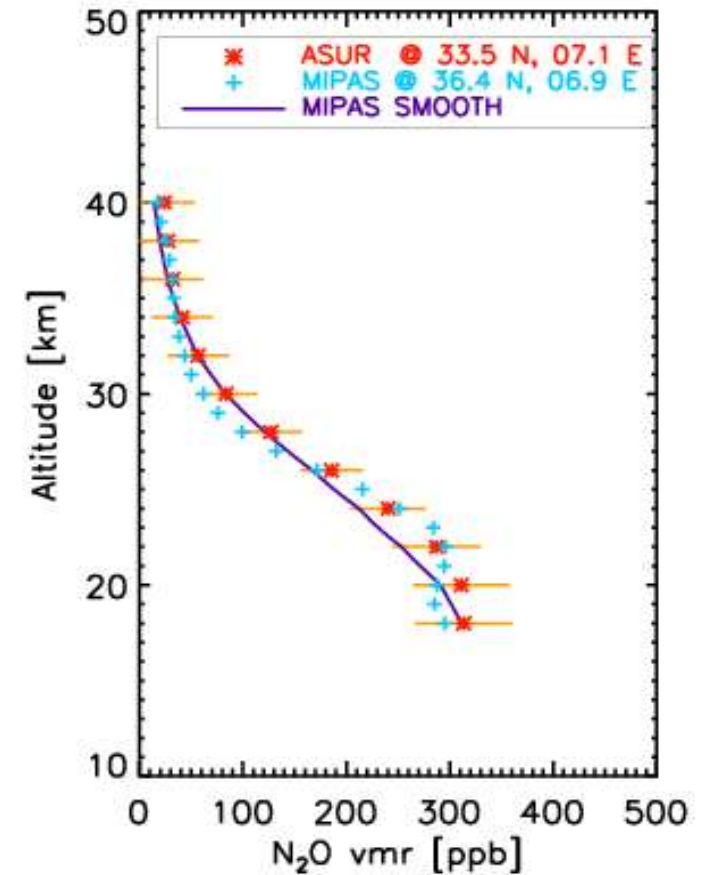
Indian Ocean
19-09-2002



Sahara
26-09-2002



Mediterranean
26-09-2002





An ample microwave dataset has been gathered during the **SCIA-VALUE** and **EuPLEx** campaigns.

Data analyses for the operational products are completed and have been uploaded to **NADIR Database**

Validation of **SCIAMACHY**, **MIPAS**, **OSIRIS** and **SMR** data are performed

Scientific studies with **ASUR** data are in progress



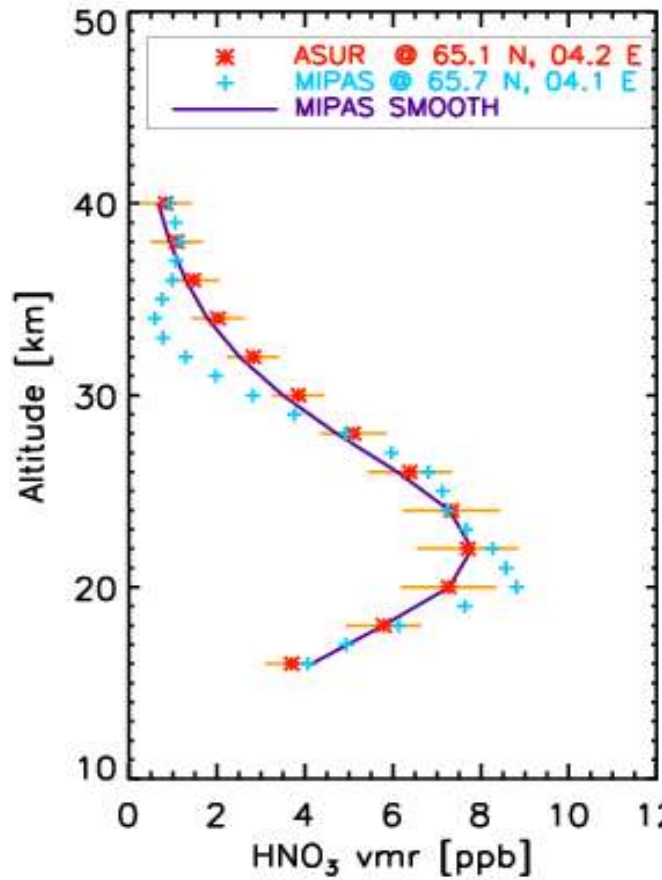
Acknowledgement

This project is funded by the German Contribution to the Validation of **SCIAMACHY (GC-VOS)** under contract FKZ 50 EE 0022 and is part of the ESA proposal **ENVISAT AO-ID 349**.

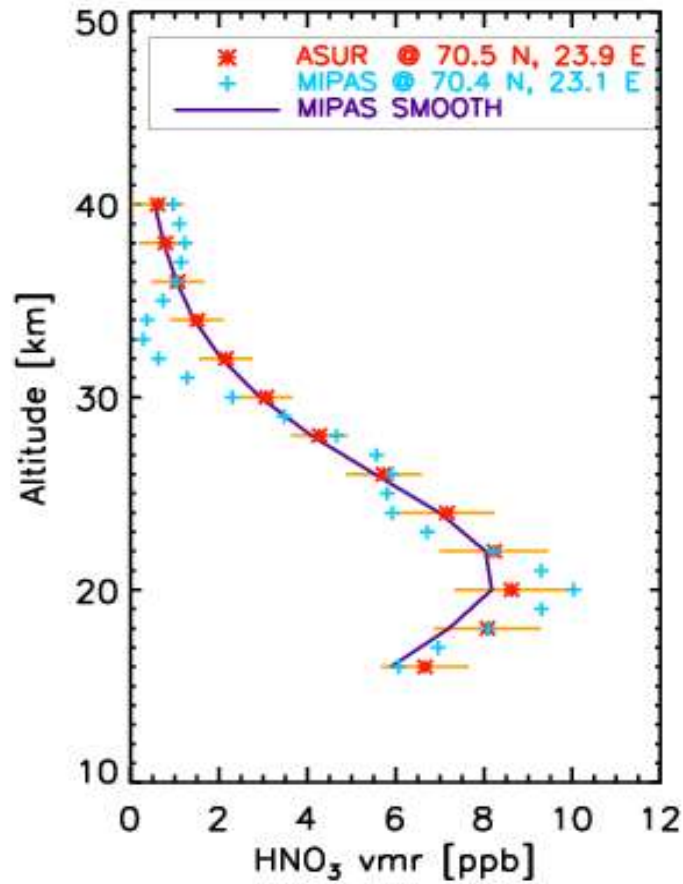


MIPAS HNO₃ validation

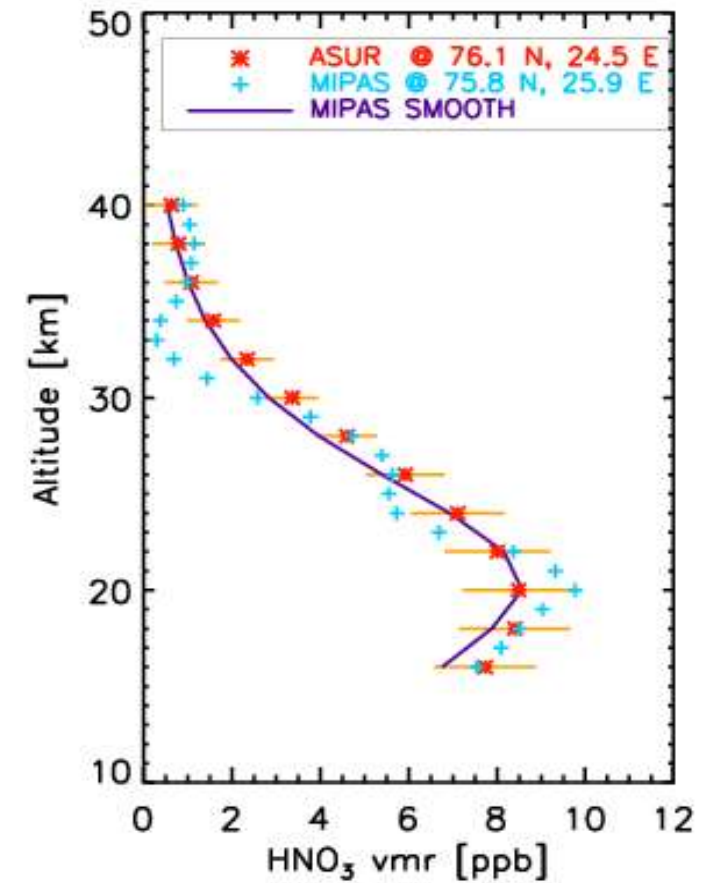
The Arctic
13-03-2002



The Arctic
12-03-2003

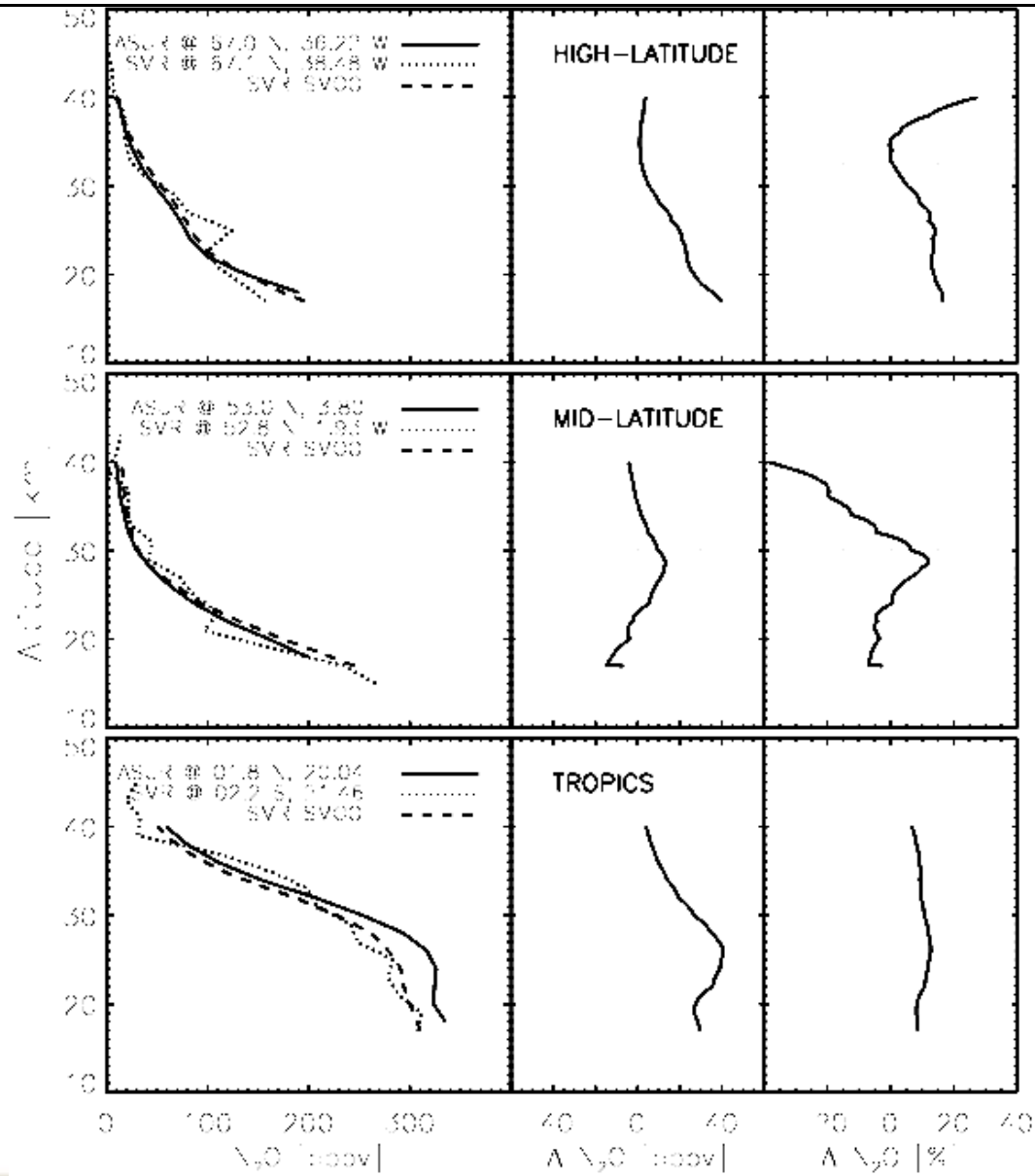


The Arctic
12-03-2003



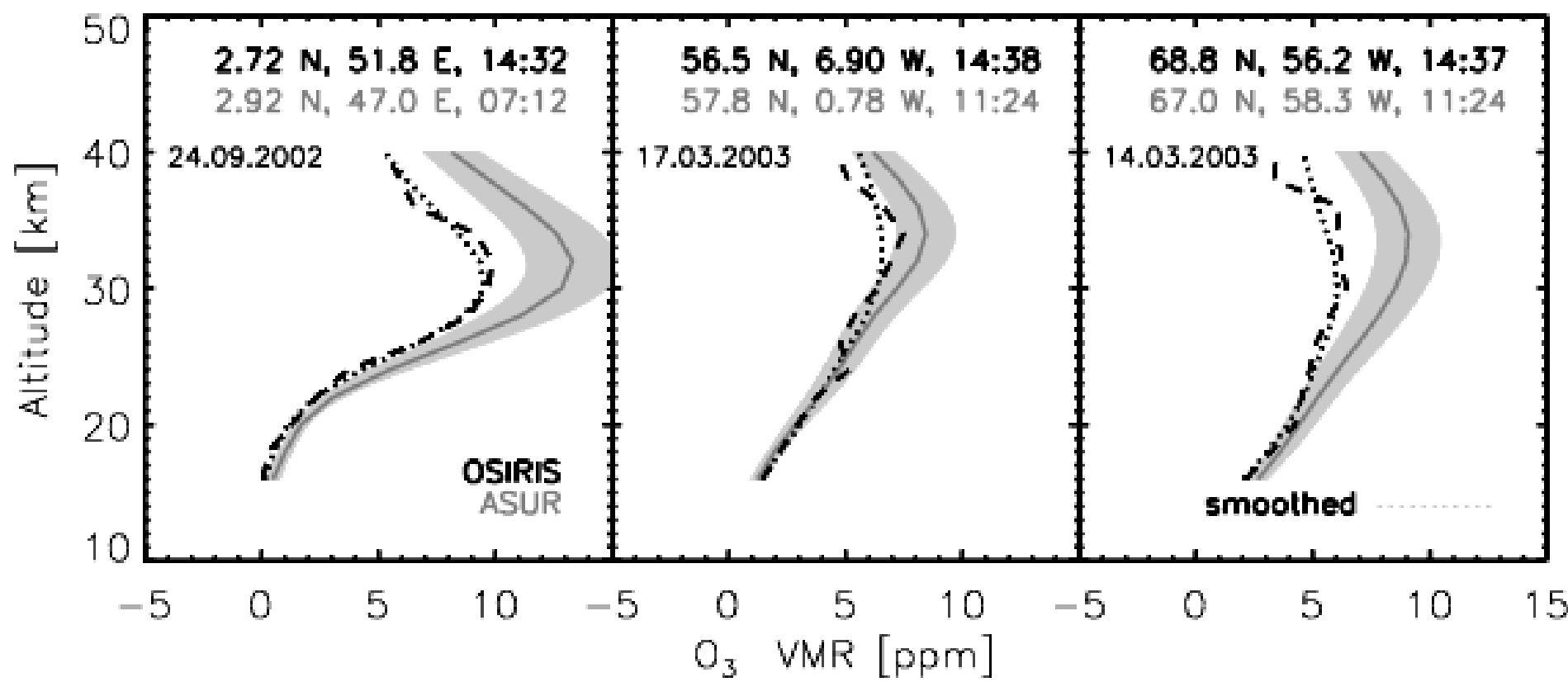


SMR/ODIN N₂O validation





SMR/ODIN ozone validation





OSIRIS/ODIN ozone validation

