Ground-based FTIR measurements in Bremen, Ny-Alesund and on board Polarstern

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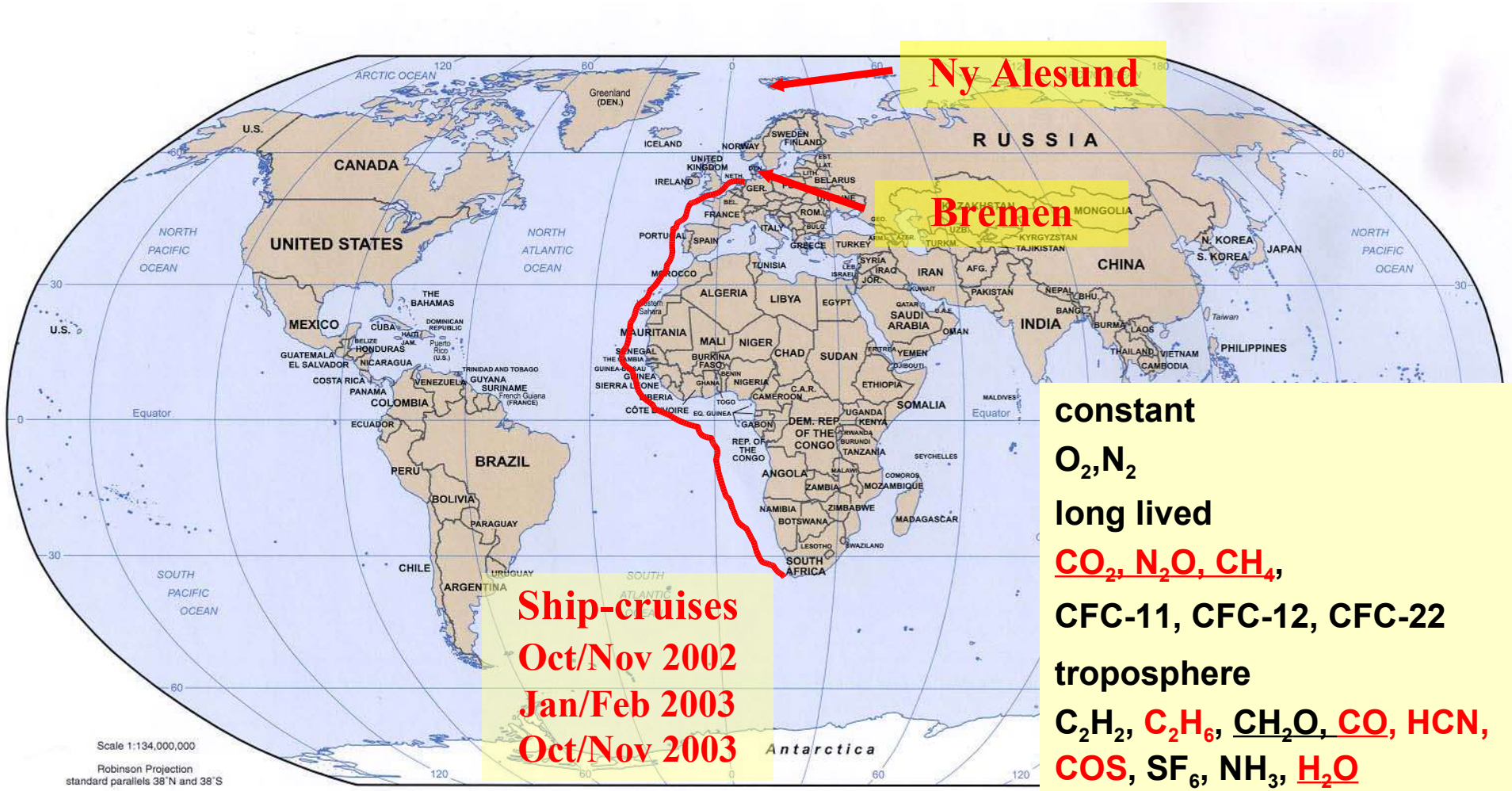
Measurements



constant

O_2,N_2

long lived

CO_2, N_2O, CH_4,

CFC-11, CFC-12, CFC-22

troposphere

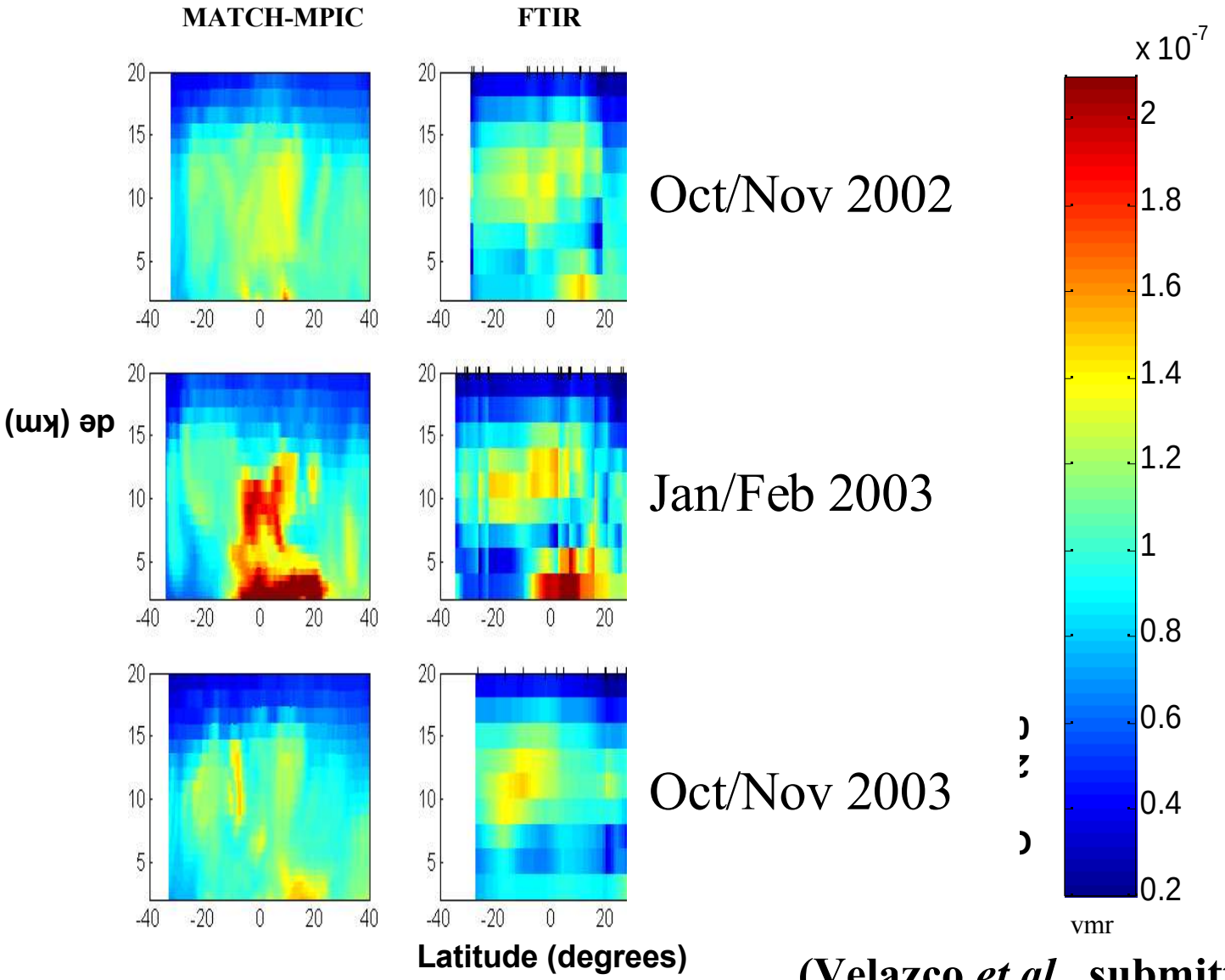
C_2H_2, C_2H_6, CH_2O, CO, HCN, COS, SF_6, NH_3, H_2O

stratosphere

O_3, HCl, ClO, $ClONO_2$,

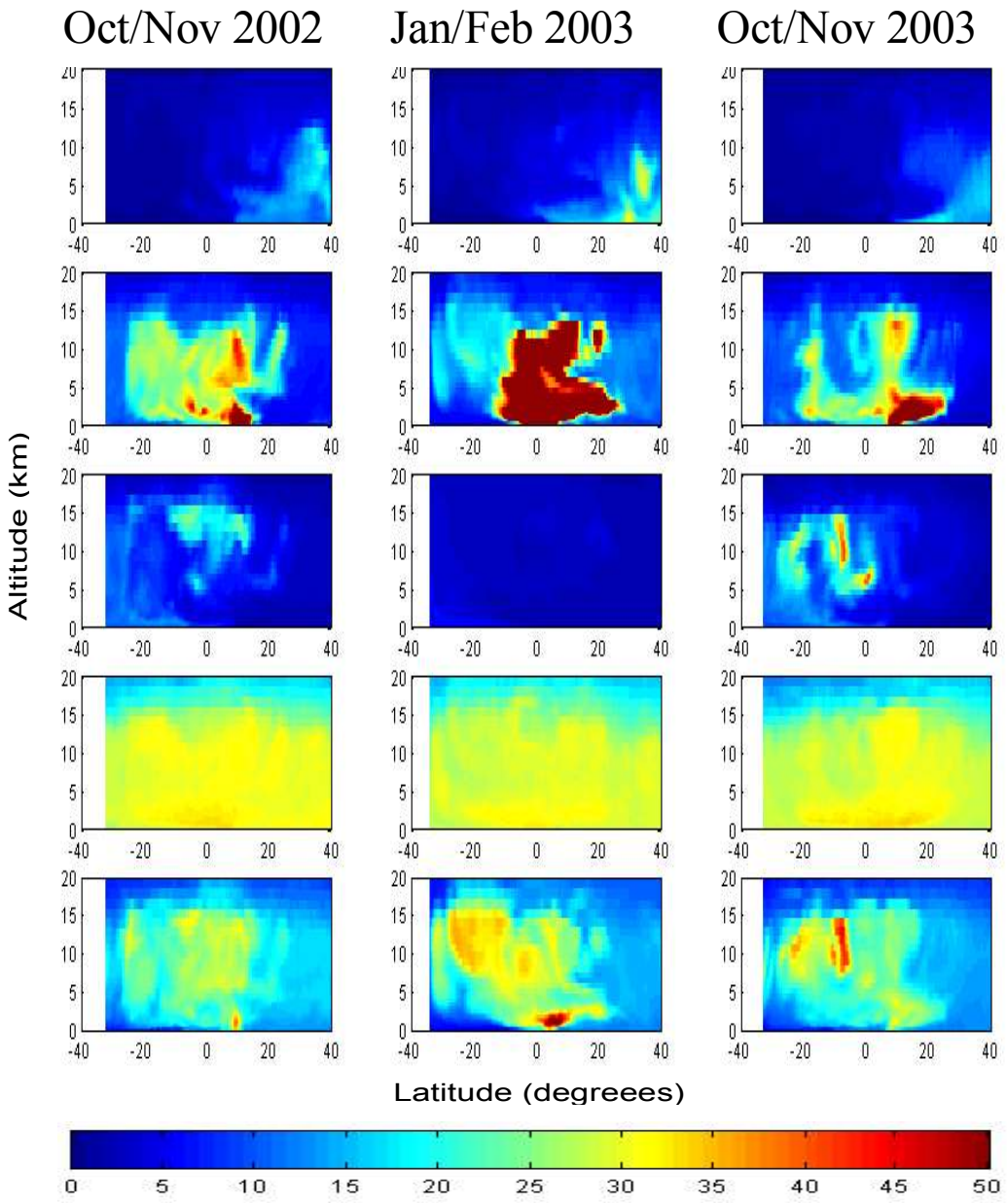
HNO_3, NO, NO_2, COF

Latitudinal variation of CO



(Velazco *et al.*, submitted to JGR)

CO sources



North American fossil fuel combustion F

African biomass burning B

South American biomass burning B

Methane

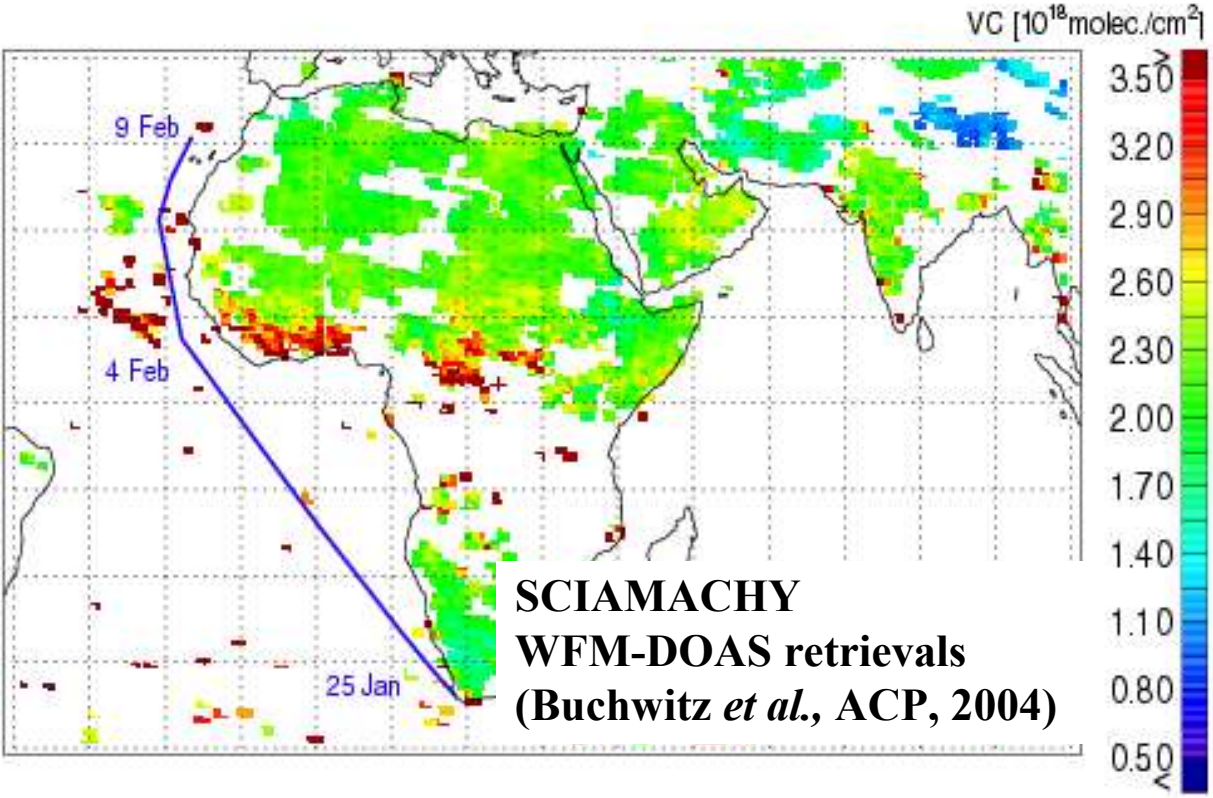
NMHC

ppb

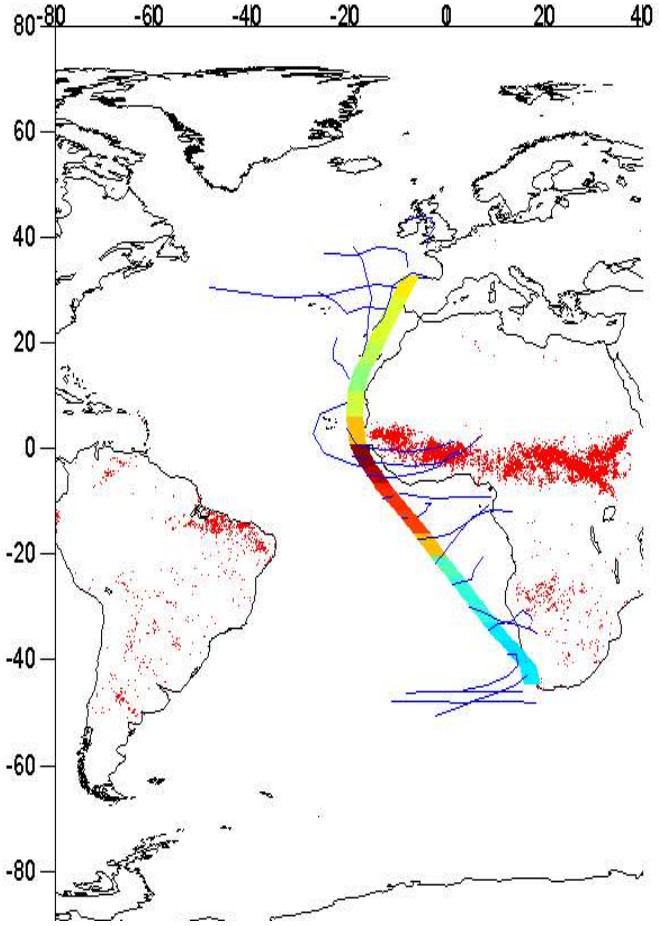
Velazco *et al.*,

submitted to JGR

Carbon monoxide: FTS - SCIAMACHY WFM-DOAS v.4.0

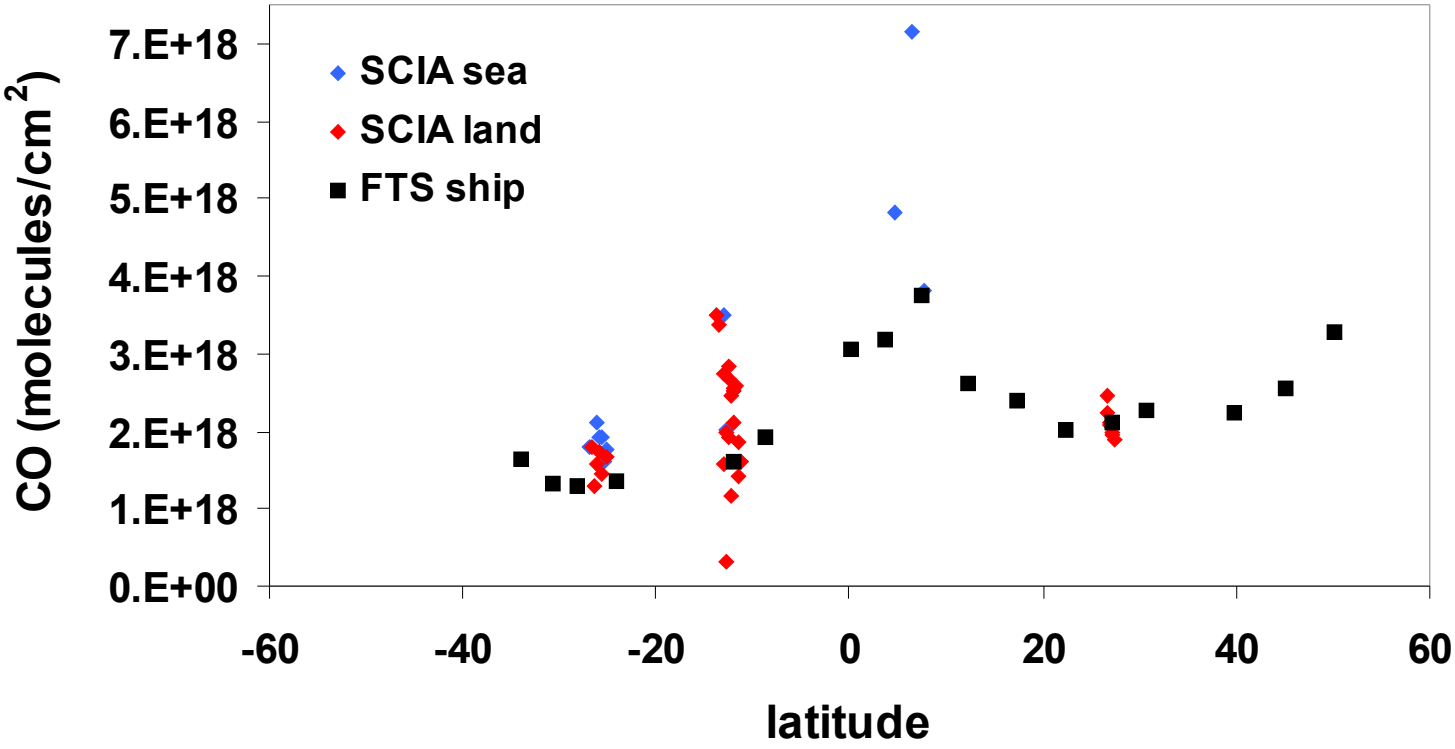


SCIAMACHY WFM-DOAS retrievals (Buchwitz *et al.*, ACP, 2004)



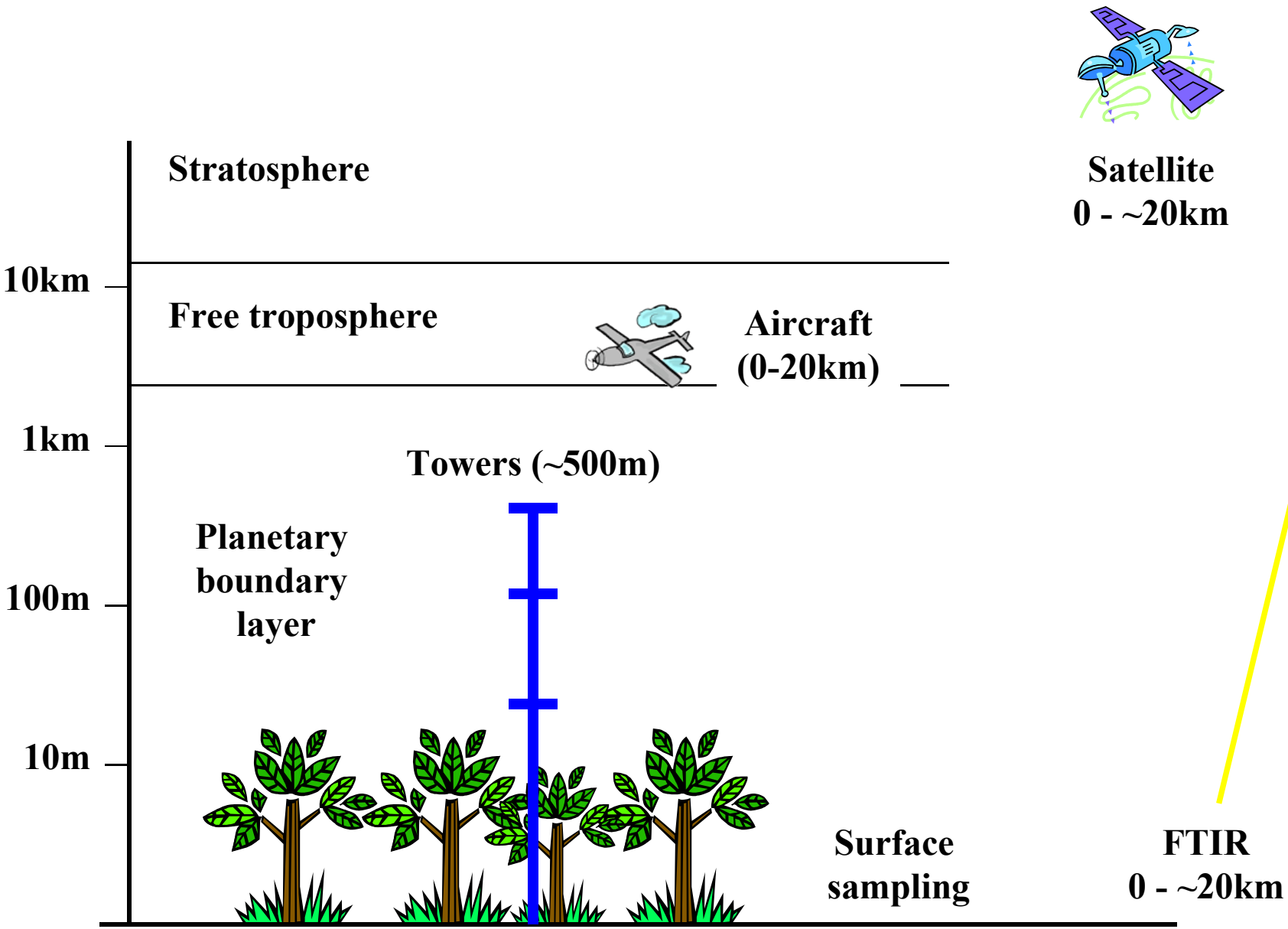
Velazco *et al.*, submitted to JGR

Carbon monoxide: FTS - SCIAMACHY WFM-DOAS v.4.0

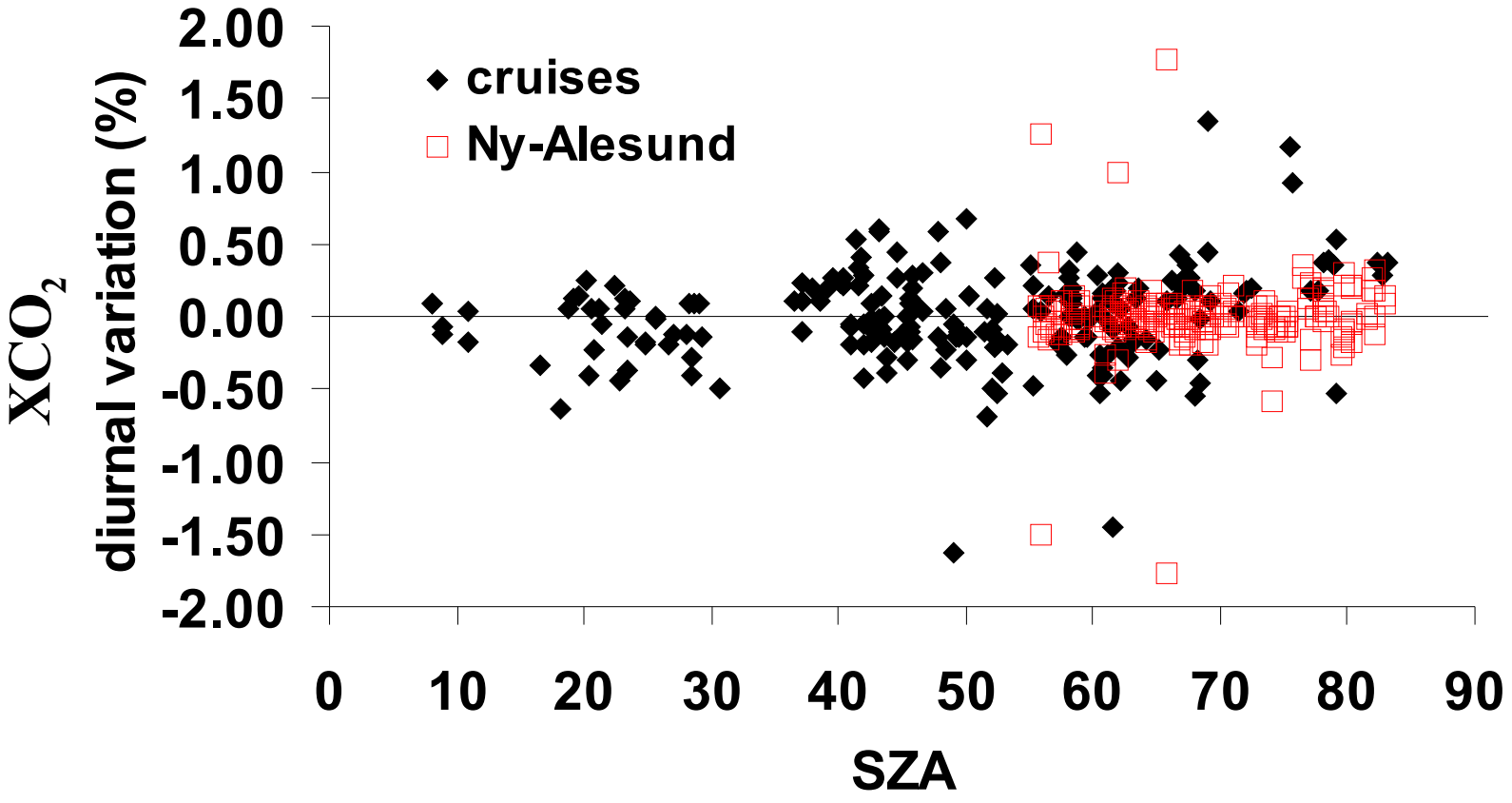


(Warneke *et al.*, submitted to ACPD)

Atmospheric CO_2



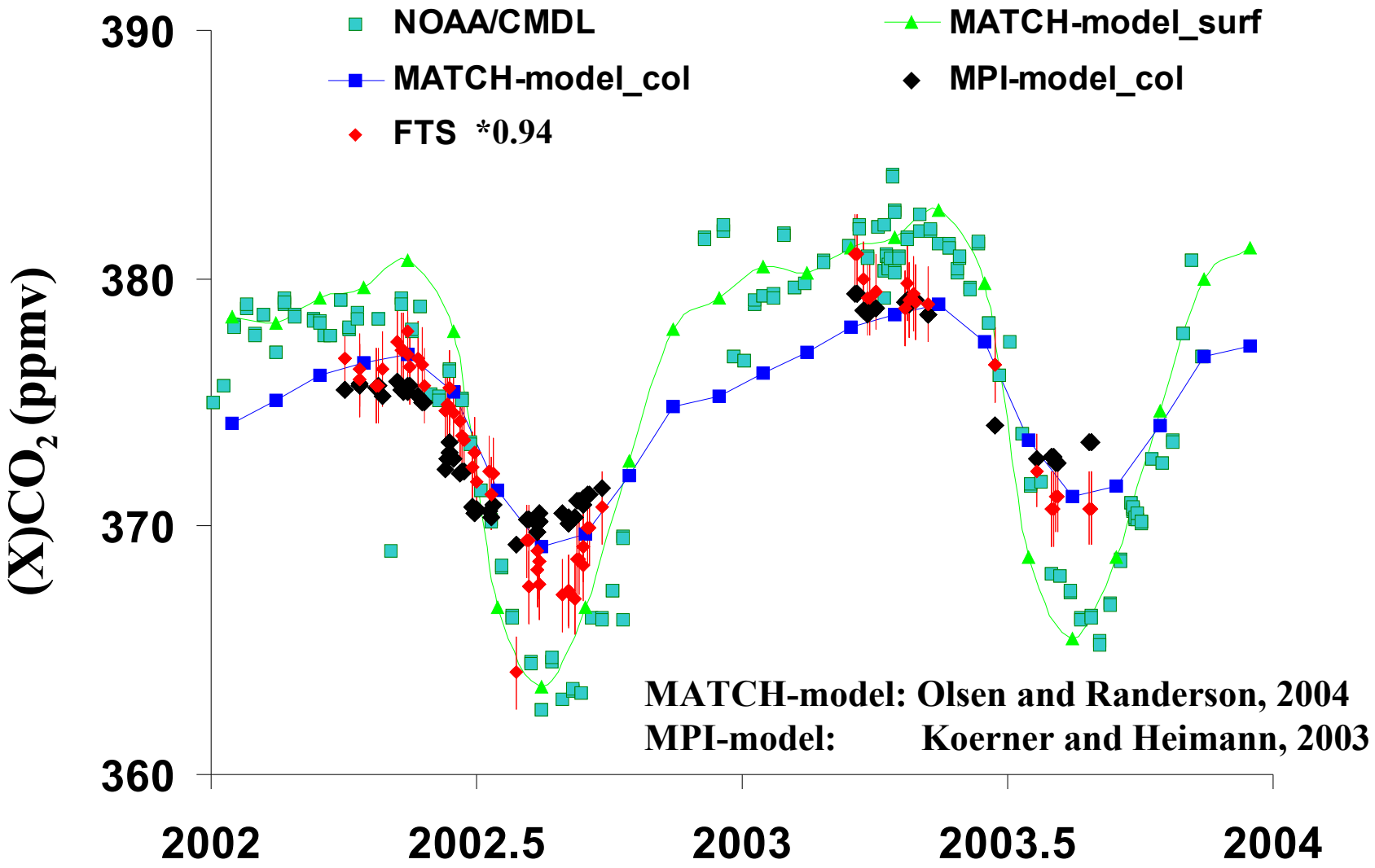
Precision of column CO_2



Diurnal variation of x = (x/<x>-1)*100

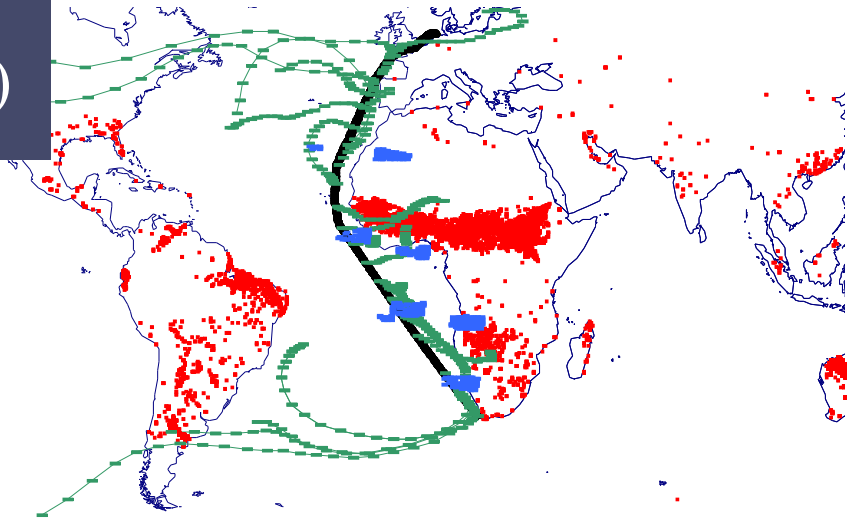
x one measurement
<x> mean of the day

Seasonal variation at Ny Alesund



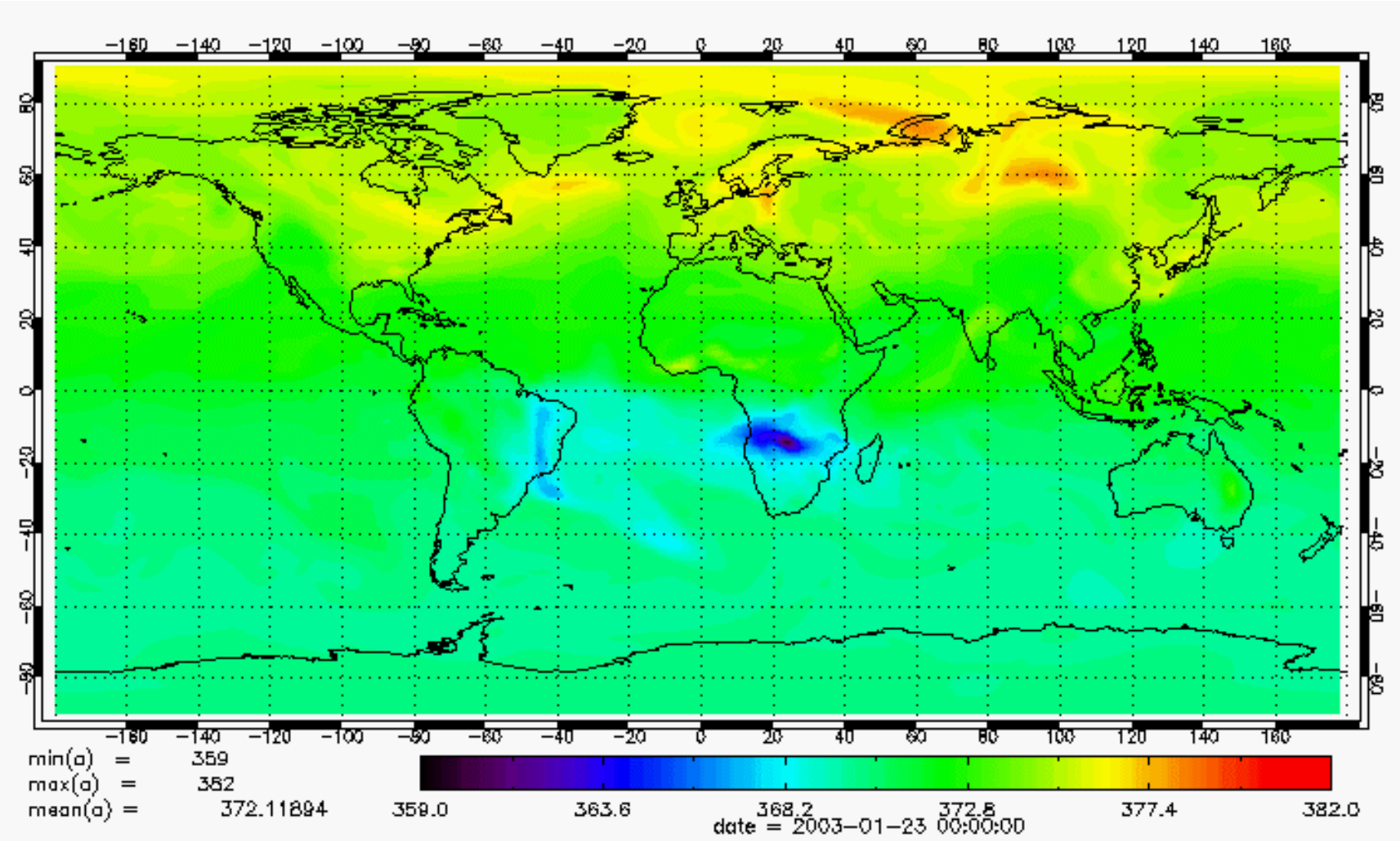
(Warneke *et al.*, submitted to GRL)

Jan/Feb 2003 (Capetown - Bremerhaven)



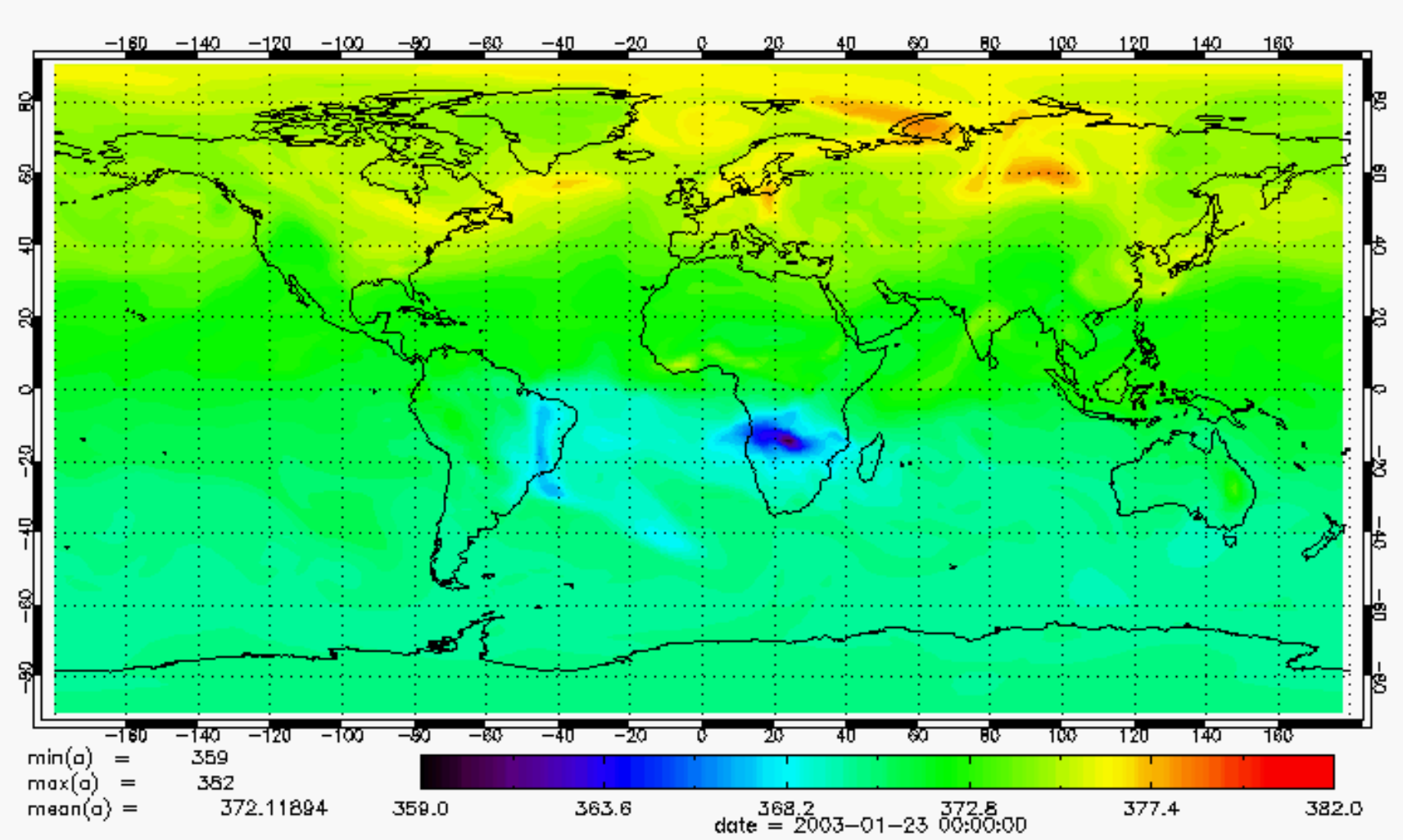
(Warneke *et al.*, submitted to GRL)

Model Jan/Feb 2003



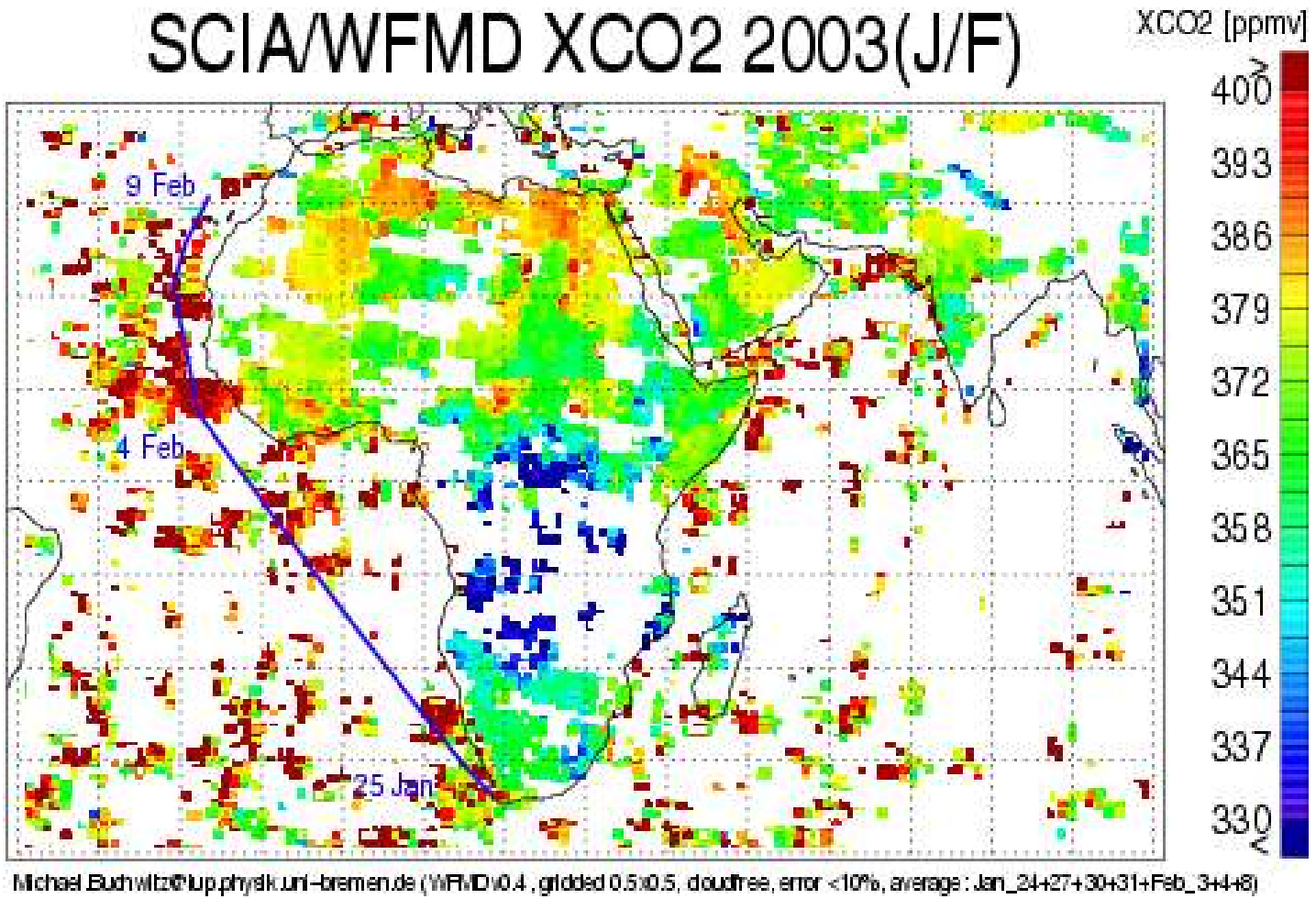
MPI-model results for the time of the cruise

Model Jan/Feb 2003



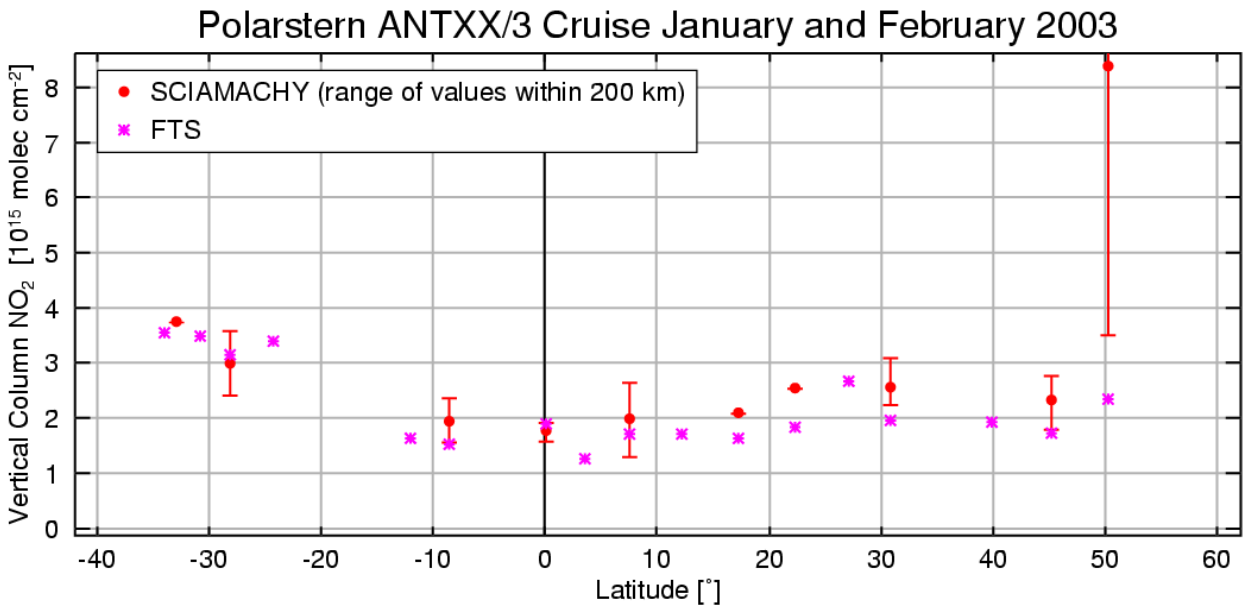
MPI-model results for the time of the cruise

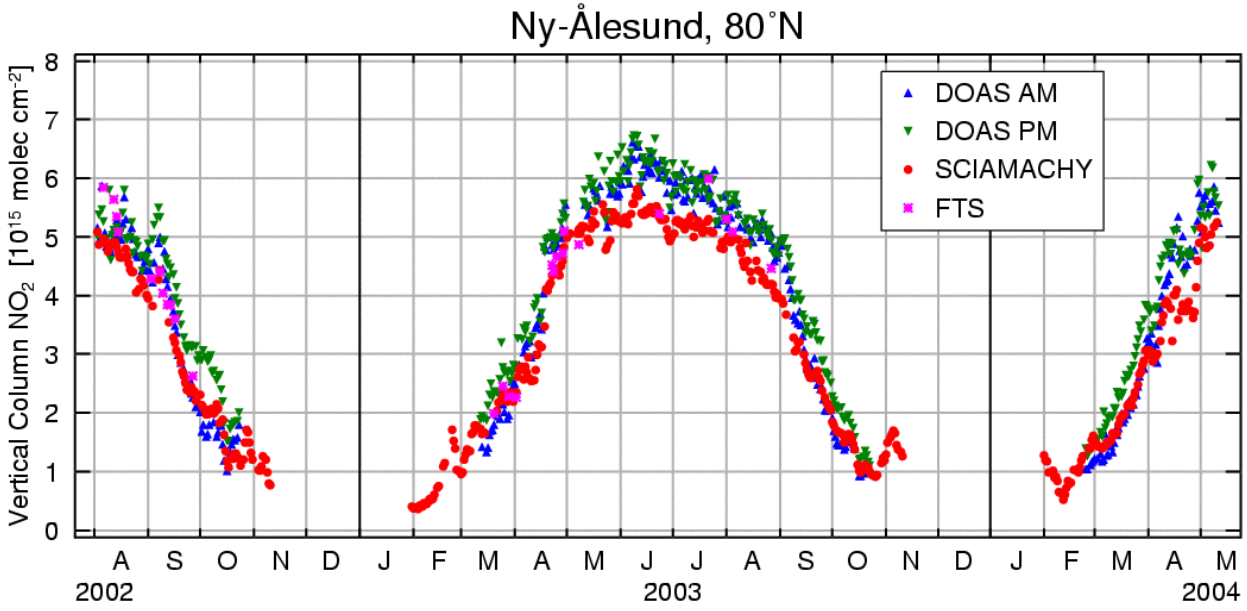
SCIAMACHY-CO_2 (WFM-DOAS v.4.0)



(Buchwitz *et al.*, ACP, 2004)

NO_2: FTS - SCIAMACHY scientific retrieval





Richter et al., ACVE-2, 2004

Summary

Measurements were successful at all sites (Ny Alesund, Bremen, Polarstern)

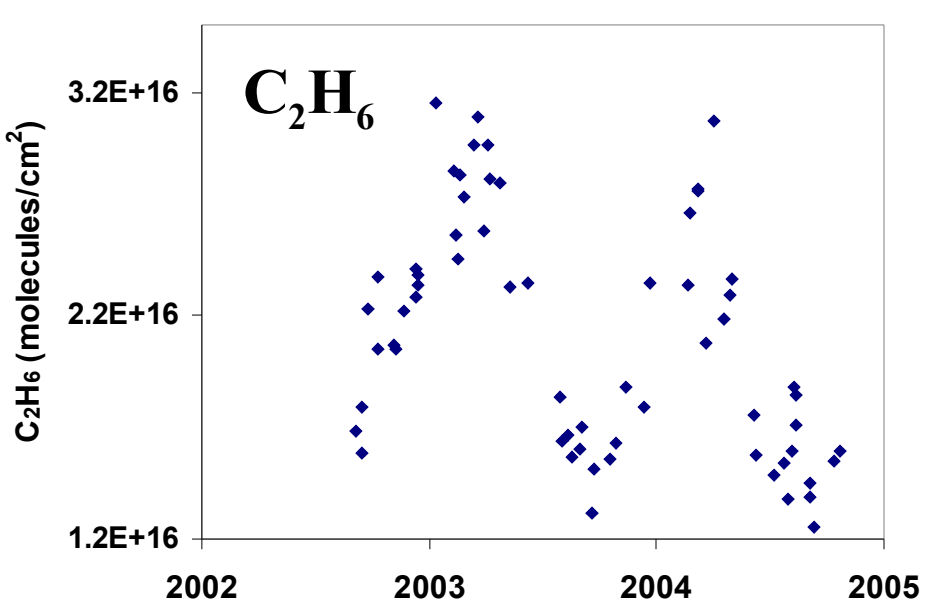
Large database of atmospheric trace gases has been created

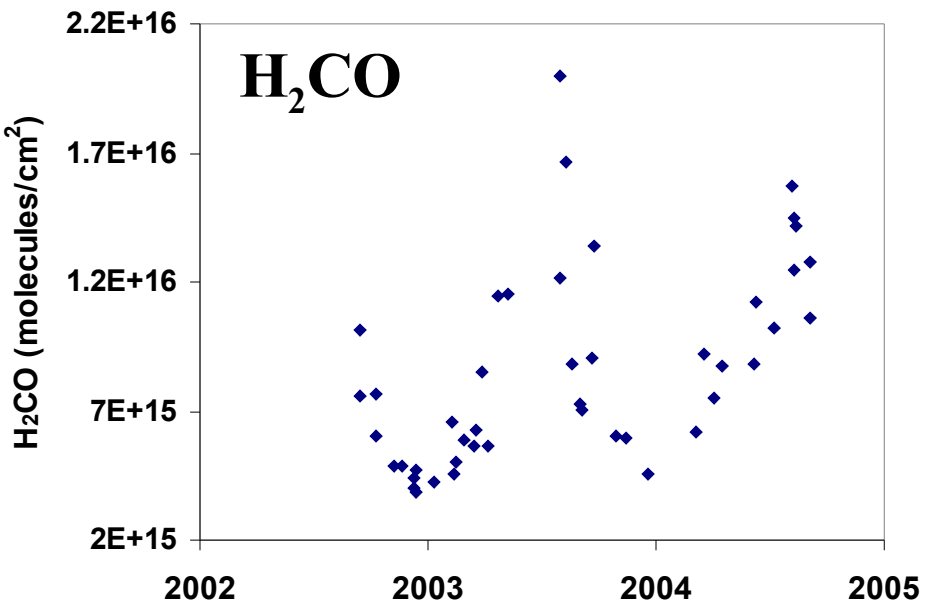
Data has been used to study long-term trend, annual variations and latitudinal variations of atmospheric trace gases (O3-layer, greenhouse gases, pollution)

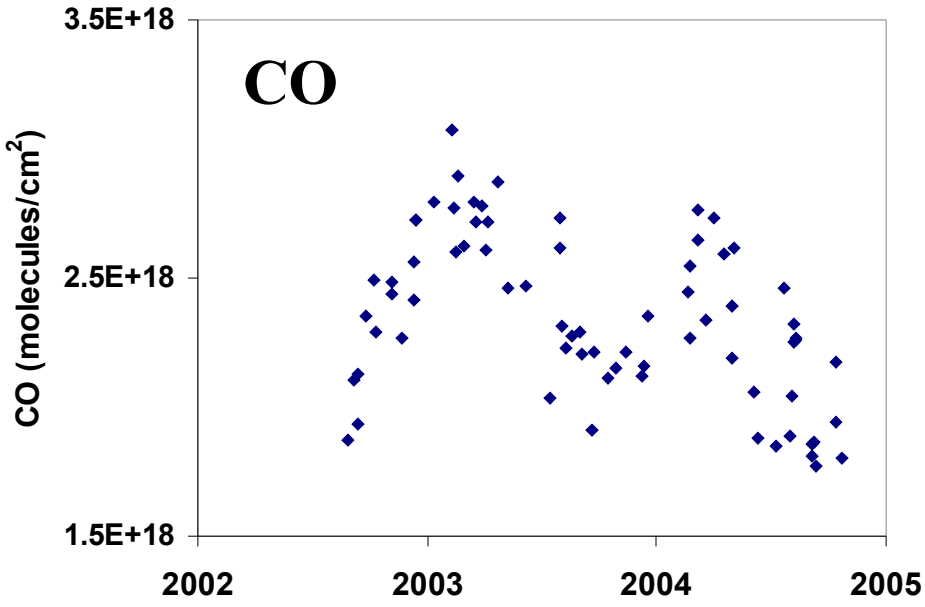
Presented today:

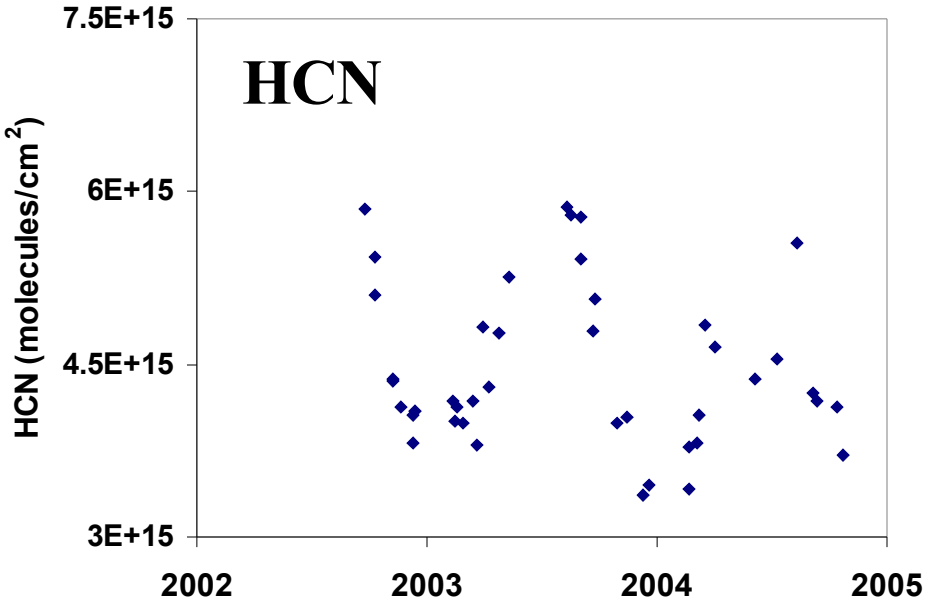
- Latitudinal variation of CO and its sources
- New measurement-principle allows the retrieval of CO_2 with precisions

Bremen, Germany (53.1°N, 8.9°E)









Ny-Alesund, Spitsbergen (78.9°N, 11.9°E)

Primary station within the "Network for Detection of Stratosperic Change„ (NDSC) since 1992.

Solar measurements: **April - September**

Lunar measurements: **October - March**

The measurements for the validation of SCIAMACHY

- **were succesful**

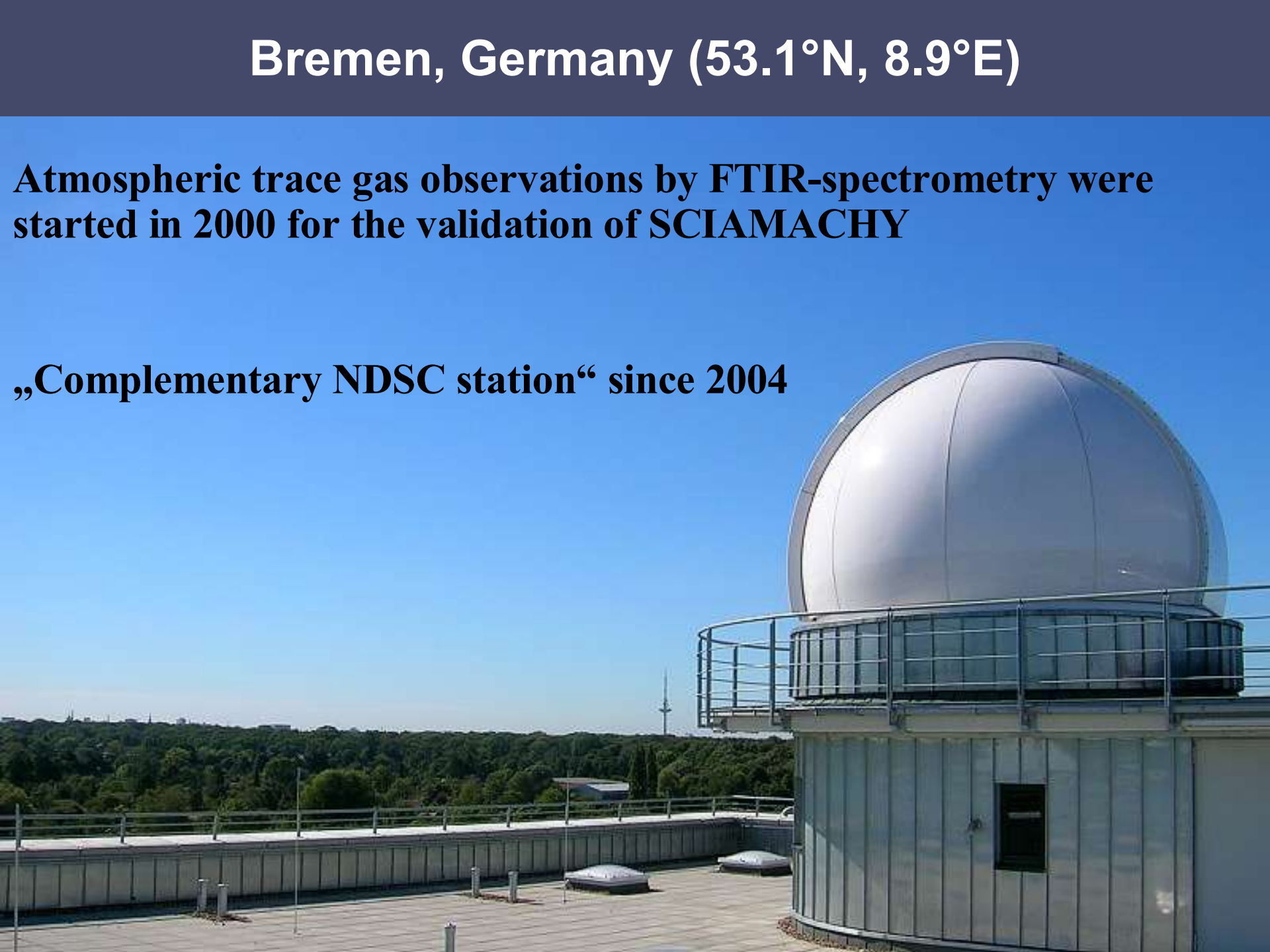
- **extent the existing record of atm trace gas observations**

  Long term trends

Bremen, Germany (53.1°N, 8.9°E)

Atmospheric trace gas observations by FTIR-spectrometry were started in 2000 for the validation of SCIAMACHY

„Complementary NDSC station“ since 2004



RV Polarstern (55°N-35°S)

Oct/Nov 2002	Bremerhaven - Cape Town
Jan/Feb 2003	Cape Town - Bremerhaven
Oct/Nov 2003	Bremerhaven - Cape Town