

# REPORT ABOUT ENVISAT SCIAMACHY NRT OZONE PRODUCT (SCI.RV\_2P) FOR AUGUST 2005

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## 1. Key points for August 2005

- SCIAMACHY data quality stable
- SCIAMACHY data about 5 DU lower in the global mean than ECMWF ozone values
- Increase of SCIAMACHY data standard deviations and a slight decrease of mean departures standard deviations in the southern mid- and high latitudes
- This monitoring report was produced with the operational ECMWF model, CY29R2

## 2. Quality and amount of received data

This report covers SCIAMACHY NRT total column ozone data for August 2005. Amount of received data and their quality are shown in Figures 1-6 for various latitude bands. Geographical distributions of mean number of data, mean observation values and mean first-guess departures are shown in Figures 7-9. Time-series of zonal mean number of data, zonal mean observation values and zonal mean first-guess departures are shown in Figures 10-12. Figures 13-15 present the scatter plots of SCIAMACHY ozone values against first-guess and latitude values, as well as the scatter plot of first-guess departures of SCIAMACHY ozone values against latitude.

The timeseries plots (Figures 1-6) show that SCIAMACHY data quality is stable in August. The values of the global mean departures (SCIAMACHY-ECMWF) have remained around -5 DU since April. From 28 July to 4 August very few KNMI SCHIAMACHY data were assimilated into the ECMWF system. As a consequence, slightly larger global mean negative biases are observed during that period.

The standard deviations of the mean departures and of SCIAMACHY data have also been stable in August. In the global mean, the former have values around 15 DU whereas the values of the latter are roughly around 30 DU. There is however an increase (about 10 DU) in the standard deviations of SCIAMACHY data and a slight decrease of the mean departures standard deviations in the southern mid- and high latitudes.

There are no data on 12 August (12 UTC), 15 August (00 and 06 UTC) and 16 August (00 UTC).

The geo plots, the hovmoeller plots and the scatter plots (Figures 7-15) show that the largest biases and largest standard deviations are observed at the southern high latitudes. These large mean departures are likely to occur at high solar zenith angles.

### **3. Remarks**

This monitoring report was produced with the operational ECMWF model (CY29R2). In cycle CY29R2 ozone layers from SBUV/2 on NOAA-16 and SCIAMACHY total column ozone data produced by KNMI are actively assimilated. The comparison of SCI\_RV\_\_2P data against the ECMWF ozone field does not give an independent validation.

All ozone values are in Dobson Units (DU).

### Statistics for Ozone from ENVISAT / SCIAMACHY

Layer = 1, 0.10 - 1013.25 hPa, All Data

Area: lon\_w= 0.0, lon\_e= 360.0, lat\_n= 90.0, lat\_s= -90.0 (all surface types)

EXP = 0001, Data Period = 2005063018 - 2005083118

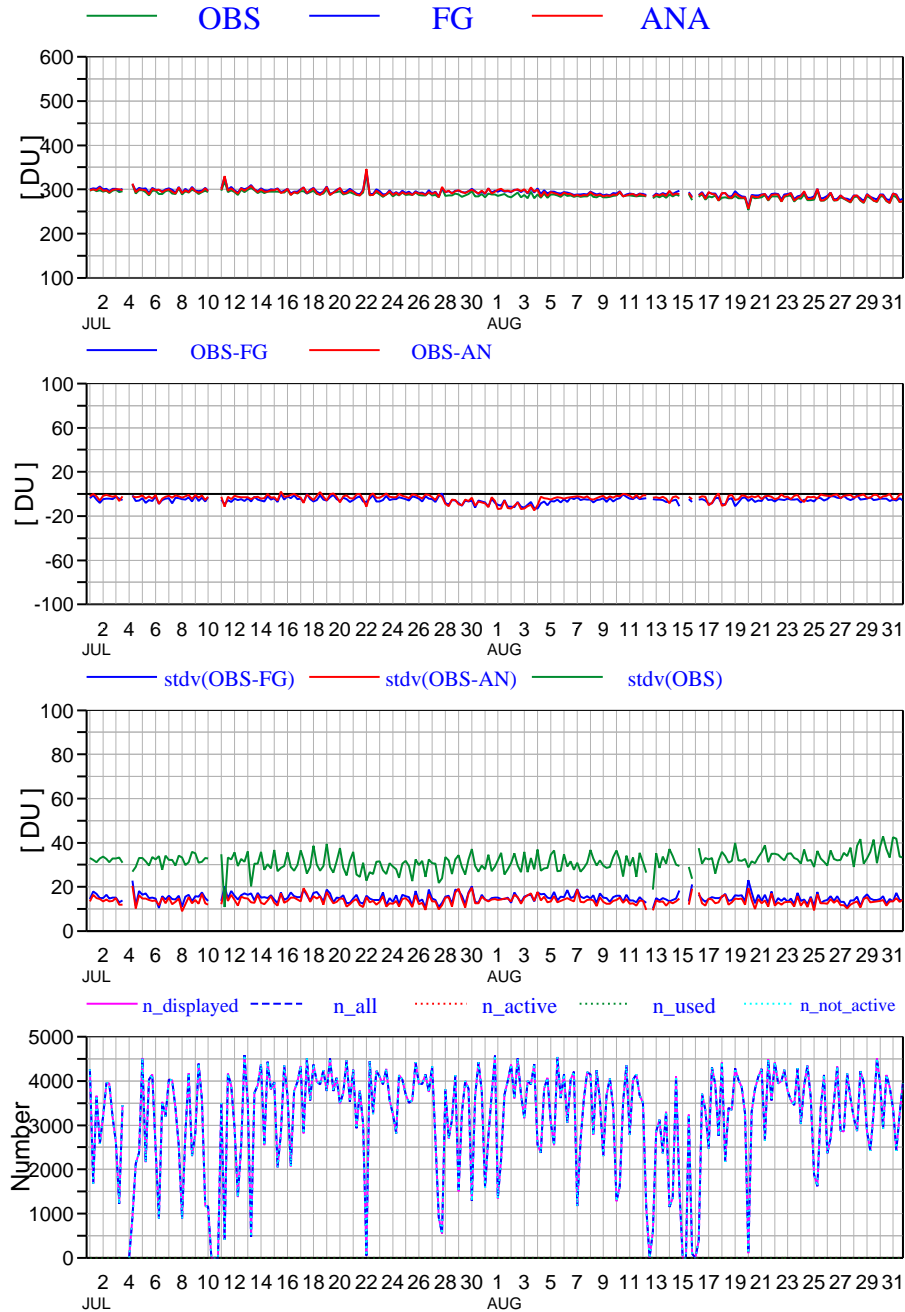


Fig. 1. Time series of mean observations, first guess and analysis values (top panel), first-guess and analysis departures (second panel), standard deviations (third panel) and number of data (bottom panel) per 6-hour cycle for ENVISAT SCIAMACHY NRT ozone data for July and August 2005 (Global means).

### Statistics for Ozone from ENVISAT / SCIAMACHY

Layer = 1, 0.10 - 1013.25 hPa, All Data

Area: lon\_w= 0.0, lon\_e= 360.0, lat\_n= 90.0, lat\_s= 60.0 (all surface types)

EXP = 0001, Data Period = 2005063018 - 2005083118

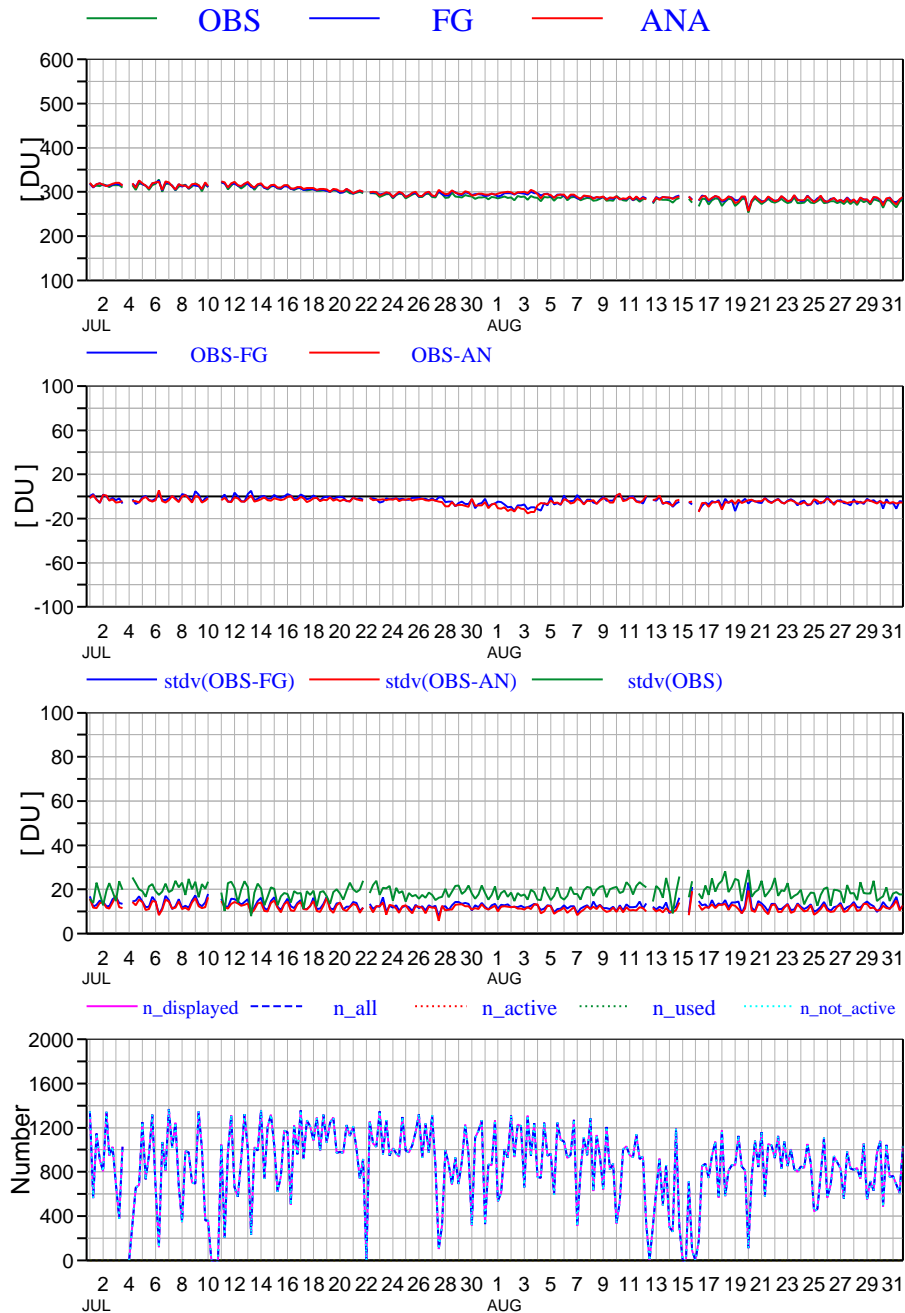


Fig. 2. As Fig.1 but for 90-60N.

### Statistics for Ozone from ENVISAT / SCIAMACHY

Layer = 1, 0.10 - 1013.25 hPa, All Data

Area: lon\_w= 0.0, lon\_e= 360.0, lat\_n= 60.0, lat\_s= 30.0 (all surface types)

EXP = 0001, Data Period = 2005063018 - 2005083118

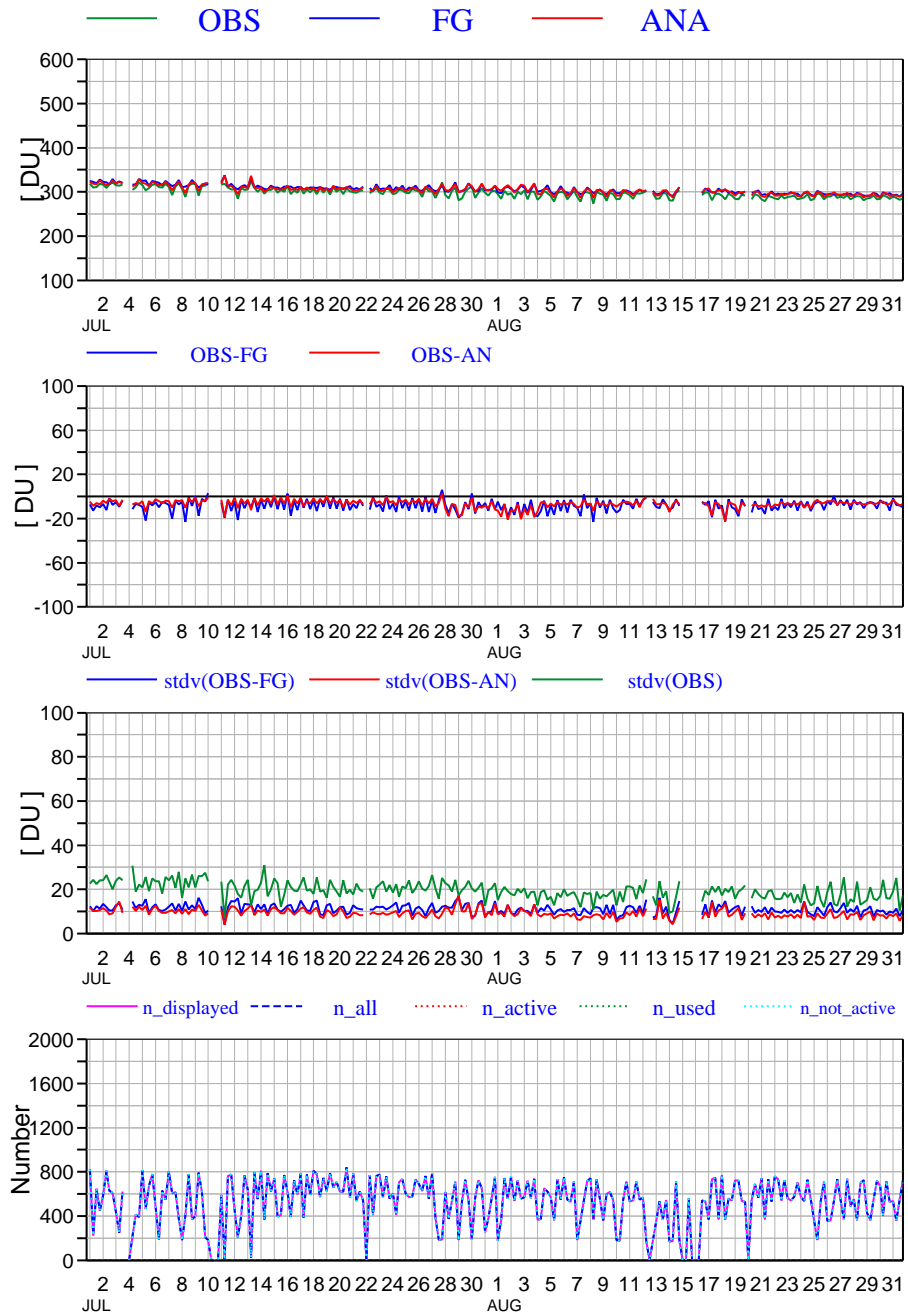


Fig. 3. As Fig. 1 but for 60-30N.

### Statistics for Ozone from ENVISAT / SCIAMACHY

Layer = 1, 0.10 - 1013.25 hPa, All Data

Area: lon\_w= 0.0, lon\_e= 360.0, lat\_n= 30.0, lat\_s= -30.0 (all surface types)

EXP = 0001, Data Period = 2005063018 - 2005083118

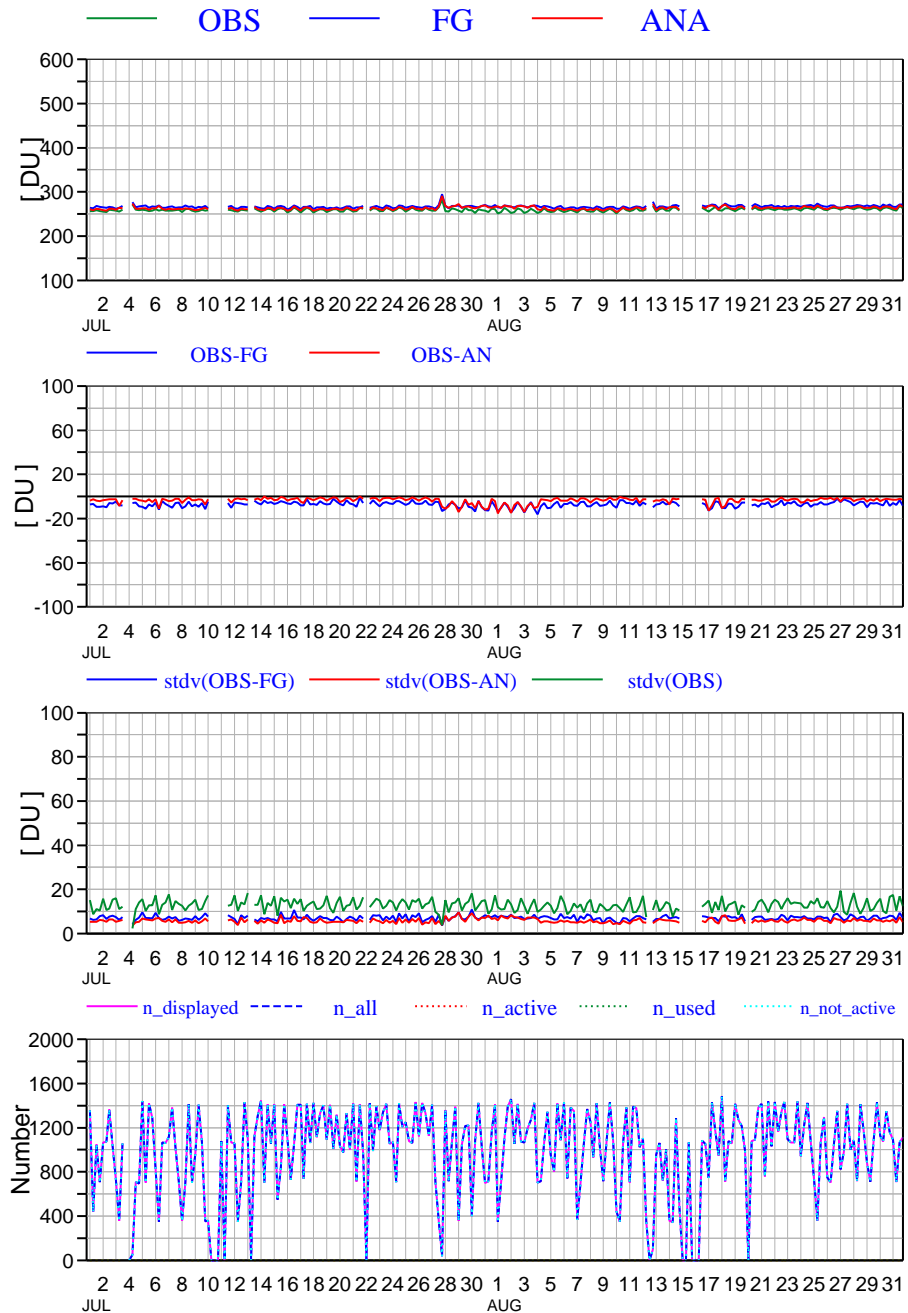


Fig. 4. As Fig. 1 but for 30N-30S.

### Statistics for Ozone from ENVISAT / SCIAMACHY

Layer = 1, 0.10 - 1013.25 hPa, All Data

Area: lon\_w= 0.0, lon\_e= 360.0, lat\_n= -30.0, lat\_s= -60.0 (all surface types)

EXP = 0001, Data Period = 2005063018 - 2005083118

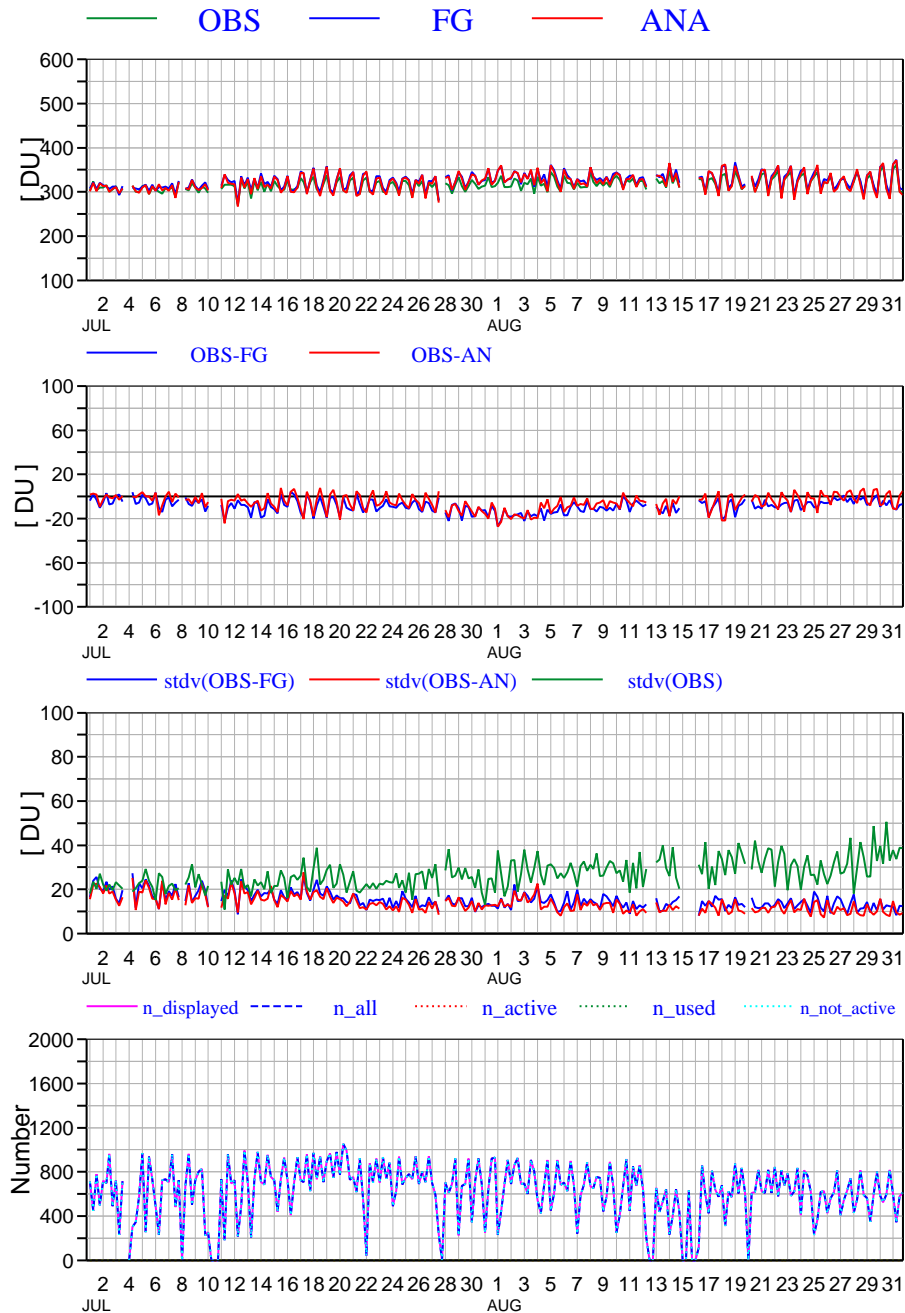


Fig. 5. As Fig. 1 but for 30-60S.

### Statistics for Ozone from ENVISAT / SCIAMACHY

Layer = 1, 0.10 - 1013.25 hPa, All Data

Area: lon\_w= 0.0, lon\_e= 360.0, lat\_n= -60.0, lat\_s= -90.0 (all surface types)

EXP = 0001, Data Period = 2005063018 - 2005083118

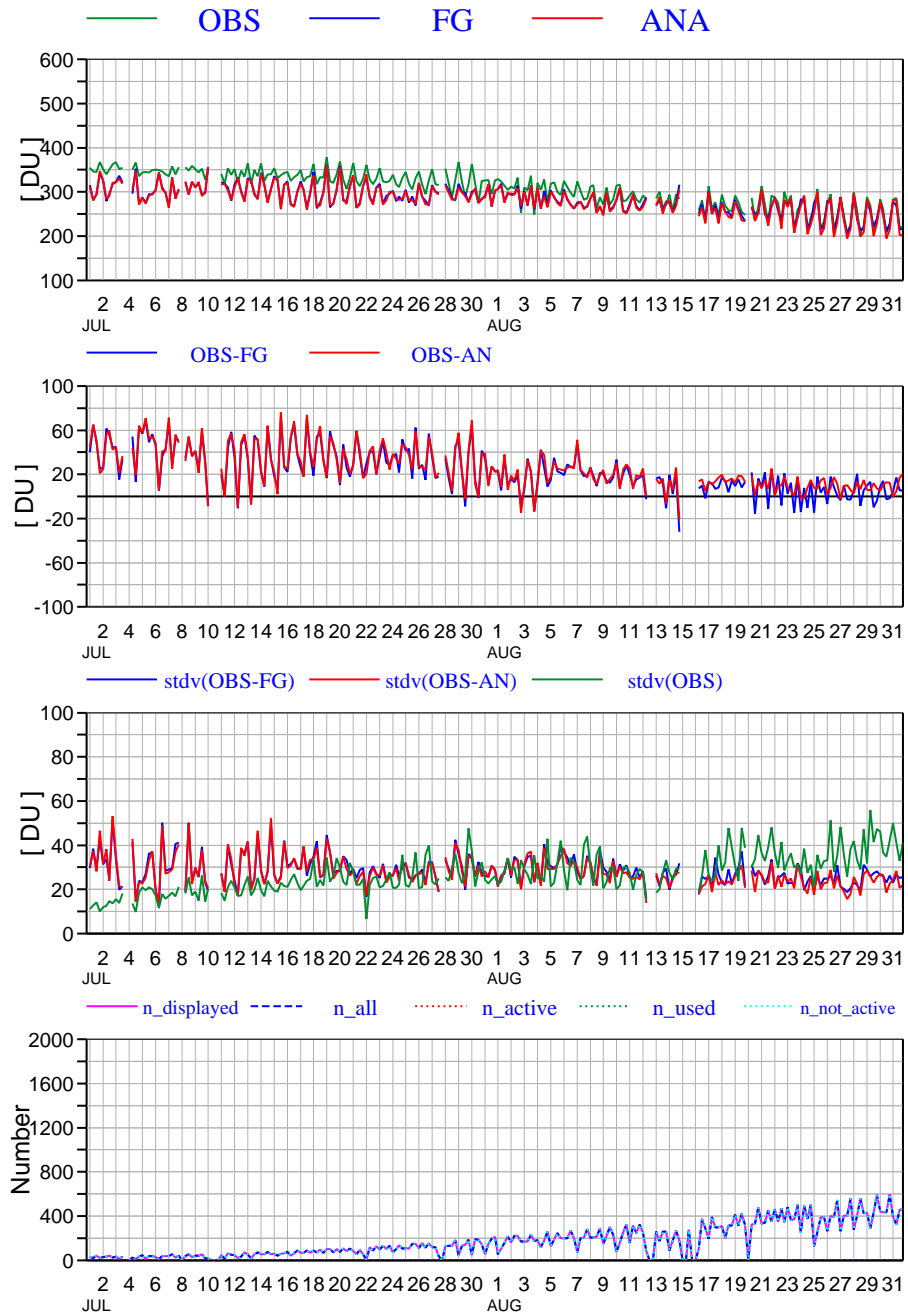


Fig. 6. As Fig. 1 but for 60-90S.



STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY  
NUMBER OF OBSERVATIONS PER GRID SQUARE (ALL)  
DATA PERIOD = 2005080100 - 2005083118  
EXP = 0001, LAYER = 01, 0.10 - 1013.25 HPA  
Min: 1      Max: 56      Mean: 6.8532

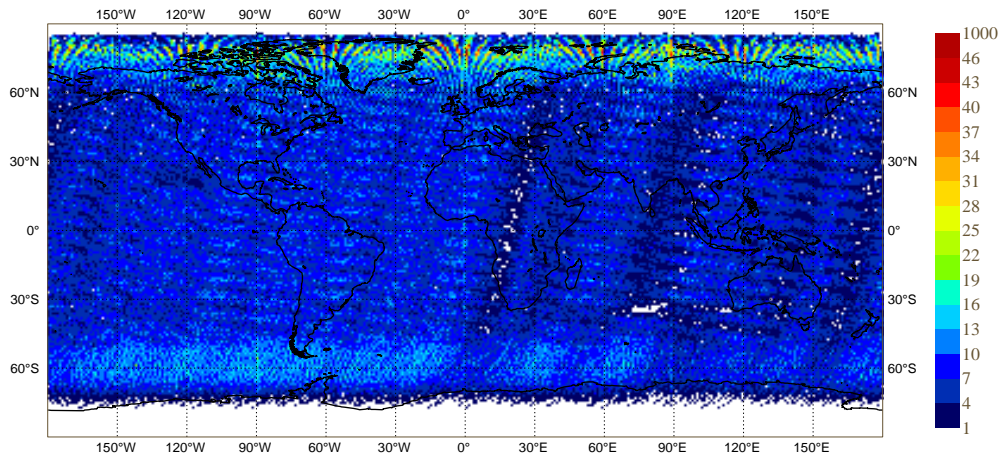


Fig. 7. Geographical distribution of mean number of data for ENVISAT SCIAMACHY NRT ozone data for August 2005.

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY  
MEAN OBSERVATION [DU] (ALL)  
DATA PERIOD = 2005080100 - 2005083118  
EXP = 0001, LAYER = 01, 0.10 - 1013.25 HPA  
Min: 89.507      Max: 409.3      Mean: 282.3

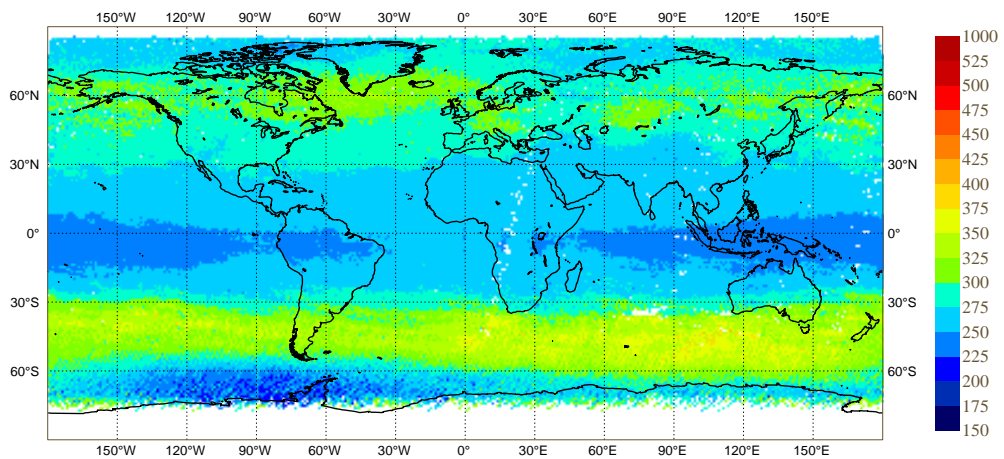


Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for August 2005.

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY  
MEAN FIRST GUESS DEPARTURE (OBS-FG) [DU] (ALL)  
DATA PERIOD = 2005080100 - 2005083118  
EXP = 0001, LAYER = 01, 0.10 - 1013.25 HPA  
Min: -139.64 Max: 159.08 Mean: -5.8194

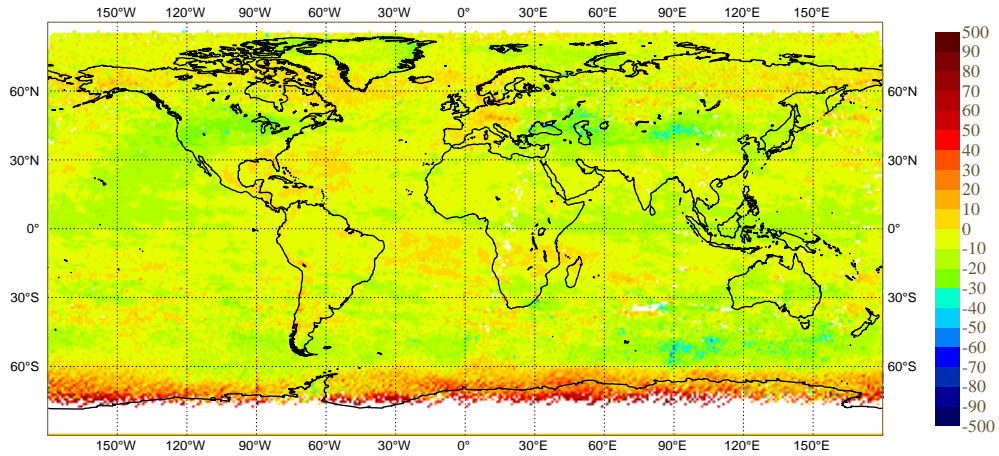


Fig. 9. Geographical distribution of mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for August 2005.

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY  
LAYER = 01, 0.10 - 1013.25 HPA (ALL)  
NUMBER OF OBSERVATIONS IN AVERAGE  
EXP = 0001, DATA PERIOD = 2005063018 - 2005083118  
Min: 0 Max: 191 Mean: 43.994

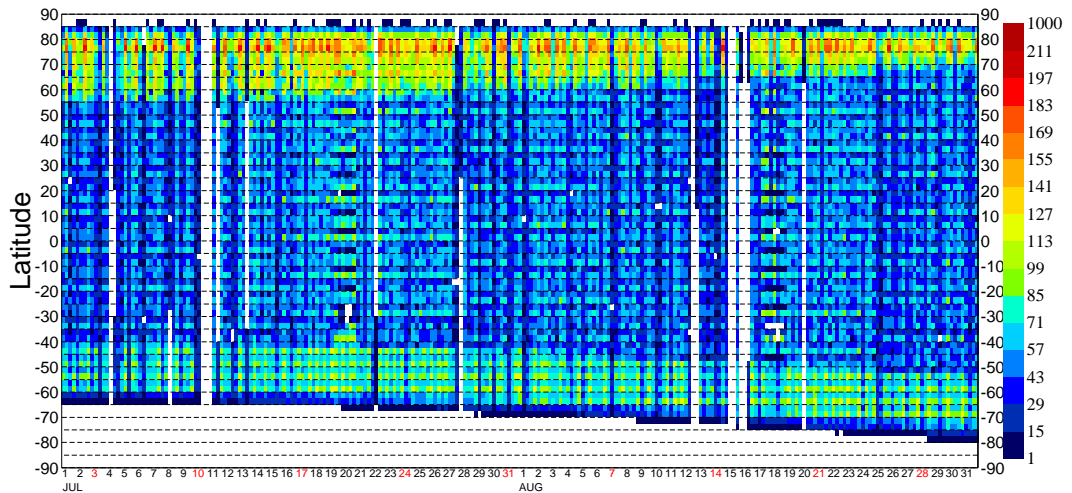


Fig. 10. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for July and August 2005.

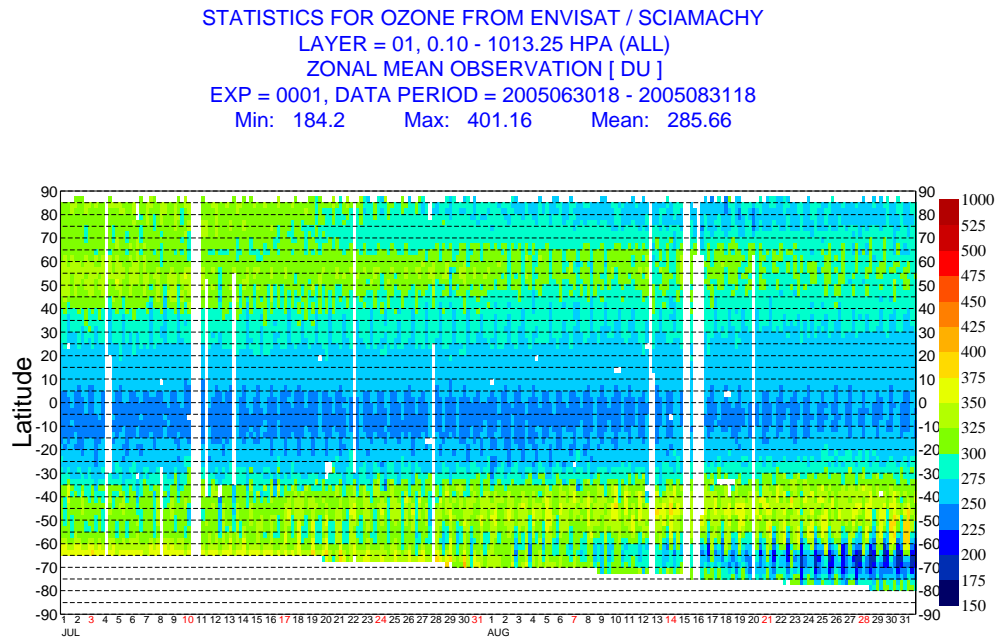


Fig. 11. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for July and August 2005.

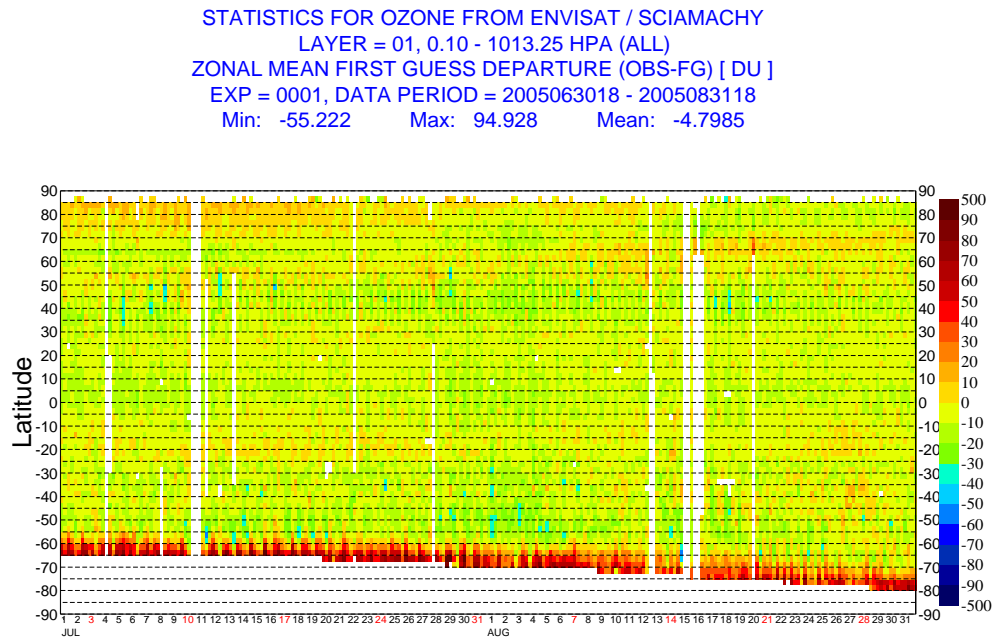


Fig. 12. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for July and August 2005.

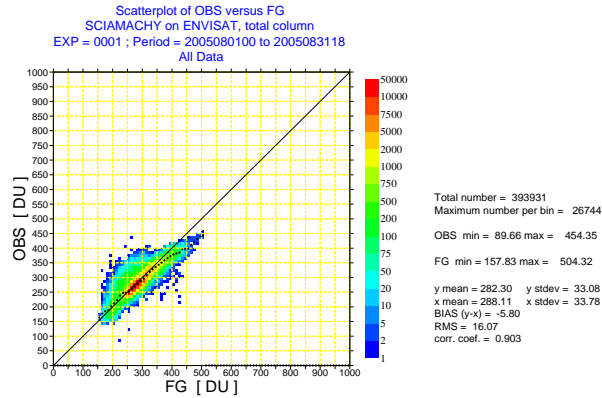


Fig. 13. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for August 2005. The colours show the number per bin, the black dots the mean values per bin.

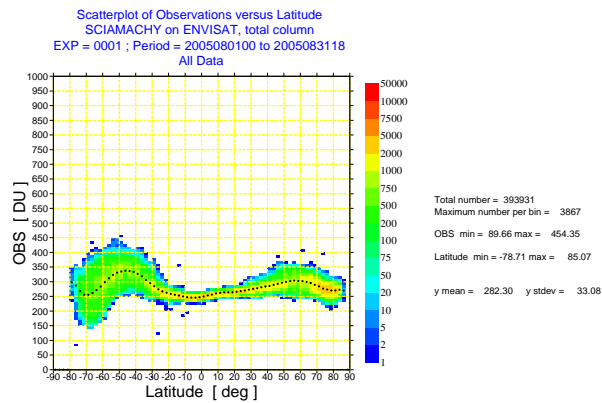


Fig. 14. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for August 2005. The colours show the number per bin, the black dots the mean values per bin.

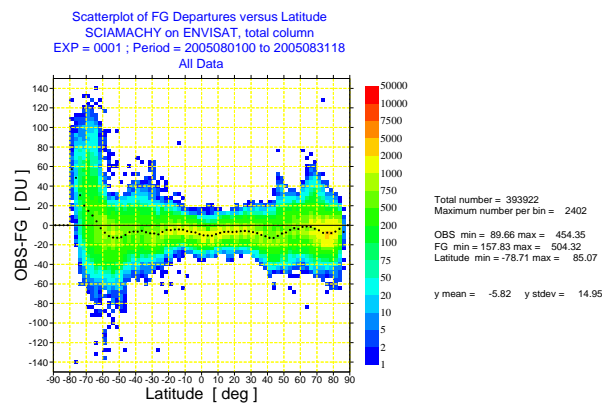


Fig. 15. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for August 2005. The colours show the number per bin, the black dots the mean values per bin.