REPORT ABOUT ENVISAT SCIAMACHY NRT OZONE PRODUCT (SCI_RV_2P) FOR MAY 2005

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June 6, 2005

1.   Key points for May 2005

- SCIAMACHY data quality stable in May.

- SCIAMACHY data about 5 DU lower in the global mean than ECMWF ozone values.

- Decrease of the SCIAMACHY data standard deviations in the global mean.

- This monitoring report was produced with the operational ECMWF model (CY29R1).

2.   Quality and amount of received data

This report covers SCIAMACHY NRT total column ozone data for May 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. Timeseries 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 ozone values and latitude 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 May. The global mean departures (SCIAMACHY-ECMWF) are around -5 DU. Slightly larger negative biases are seen in the northern hemisphere (60N-30N) and in the tropics (30N-30S). The drift towards larger positive departures observed at the high southern latitudes (60S-90S) in April is still present this month. Note however the small sample size to compute the mean values over the high southern latitudes (there are no data south of 70S).

The standard deviations of the first-guess and analysis departures are also stable in May. In the global mean those values are roughly around 15 DU. Larger values are seen at the high southern latitudes but as before there are no data south of 70S. At the northern high latitudes the standard deviations of the mean departures have decreased as compared to the previous month. A drift towards smaller values is observed in the SCIAMACHY data standard deviations in the global mean throughout May.

From the geo plots, the hovmoeller plots and the scatter plots (Figures 7-15) one can see that the large positive departures observed around 70N last month have disappeared. However large positive biases are still seen at the southern high latitudes. These large mean departures are likely to occur at high solar zenith angles.

The missing data on 9 and 12-13 May is due to an instrument anomaly (single event upset).

3. Remarks

This monitoring report was produced with the operational ECMWF model (CY29R1). In CY29R1 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).

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 April and May 2005 (Global means).
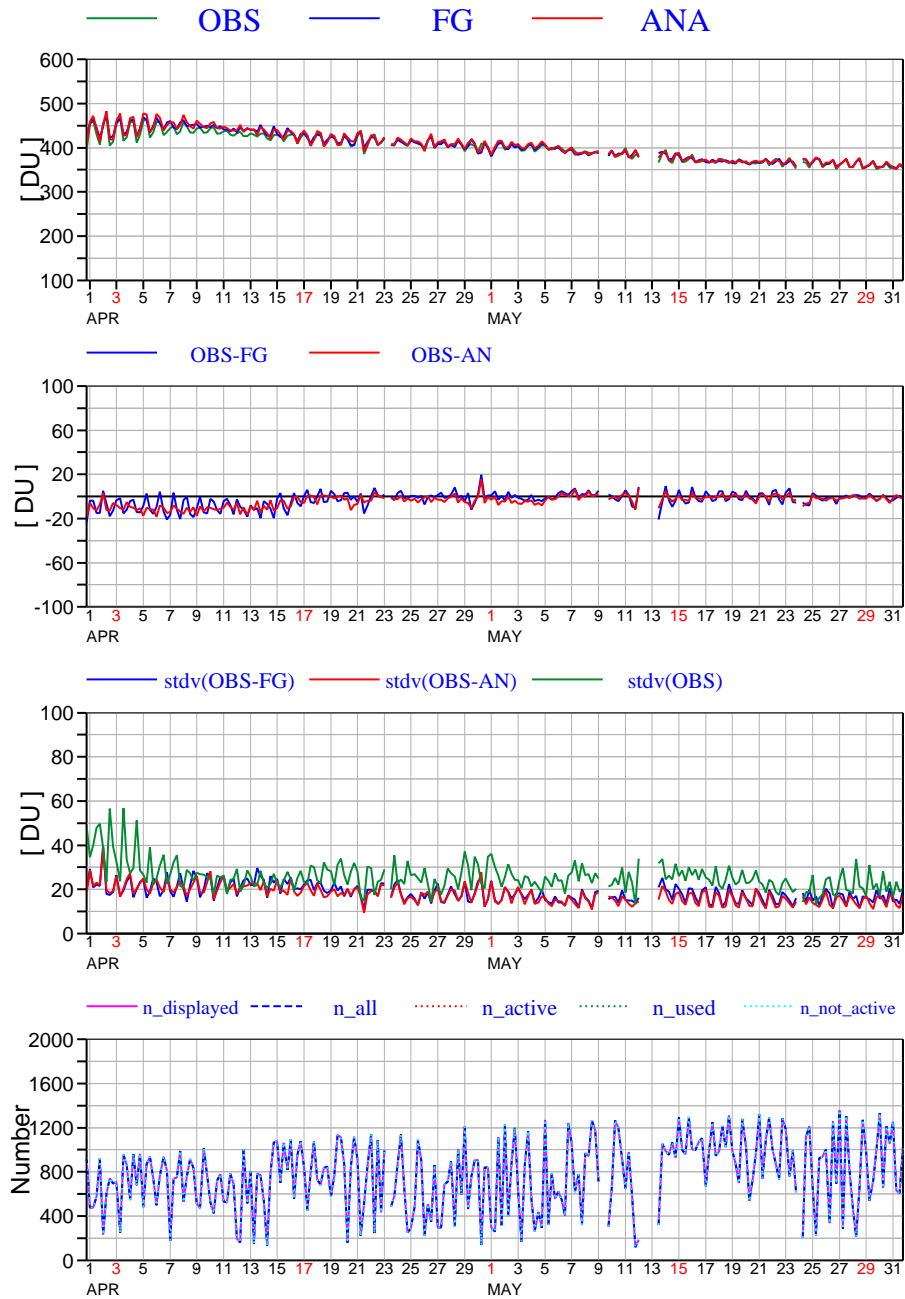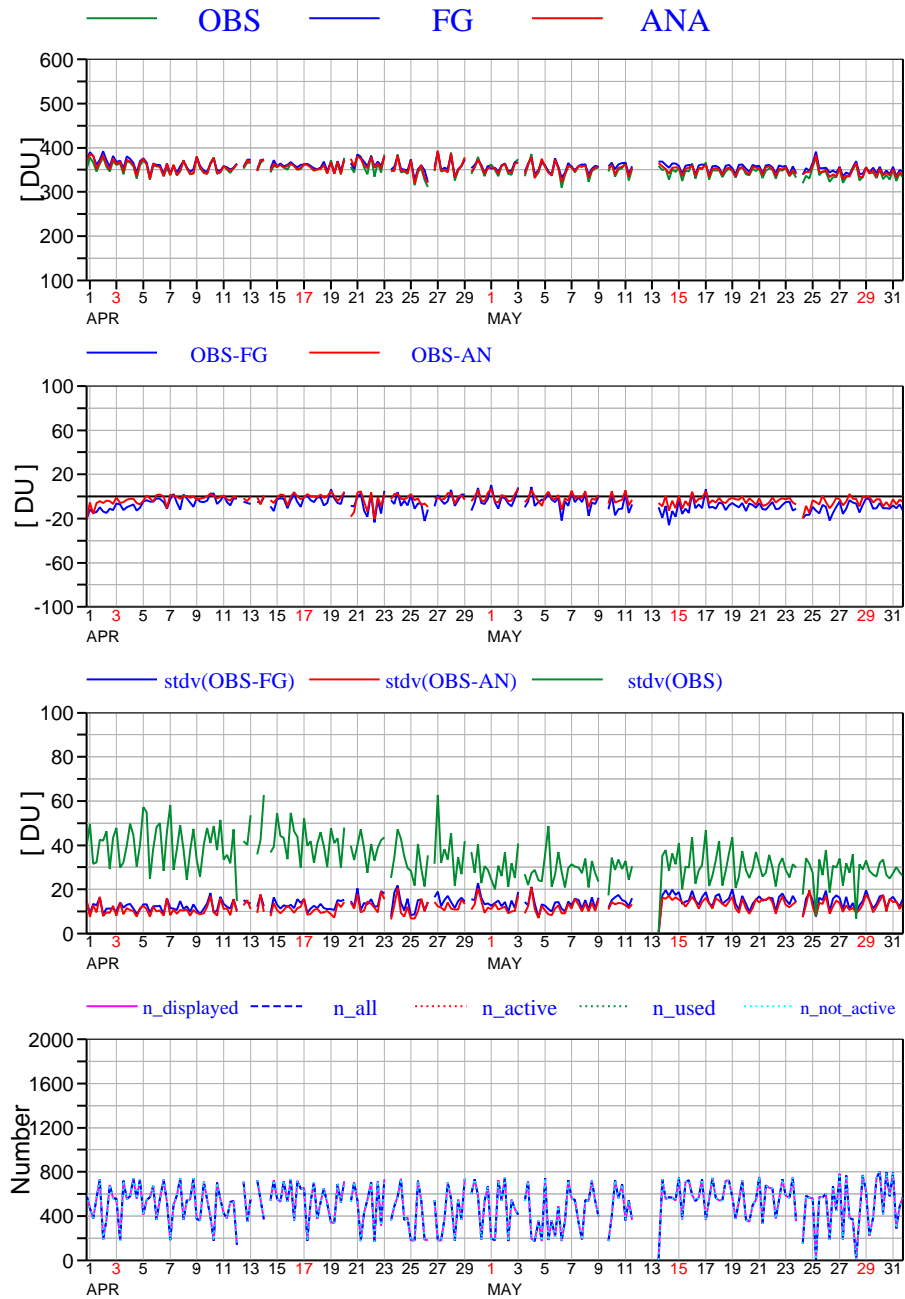
Statistics for Ozone from ENVISAT / SCIAMACHY

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)

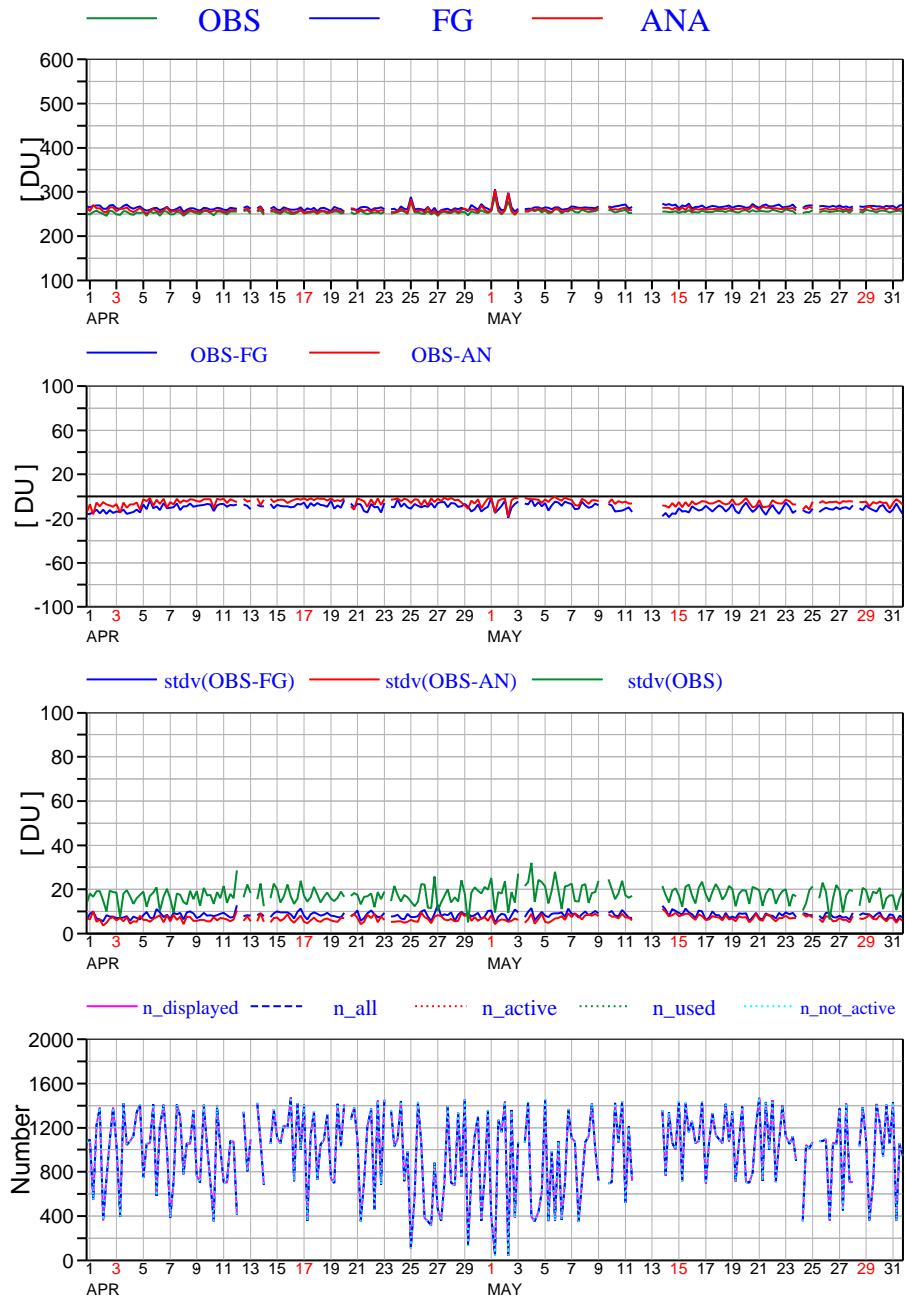**EXP = 0001, Data Period = 2005033118 - 2005053118**

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

4

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

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)
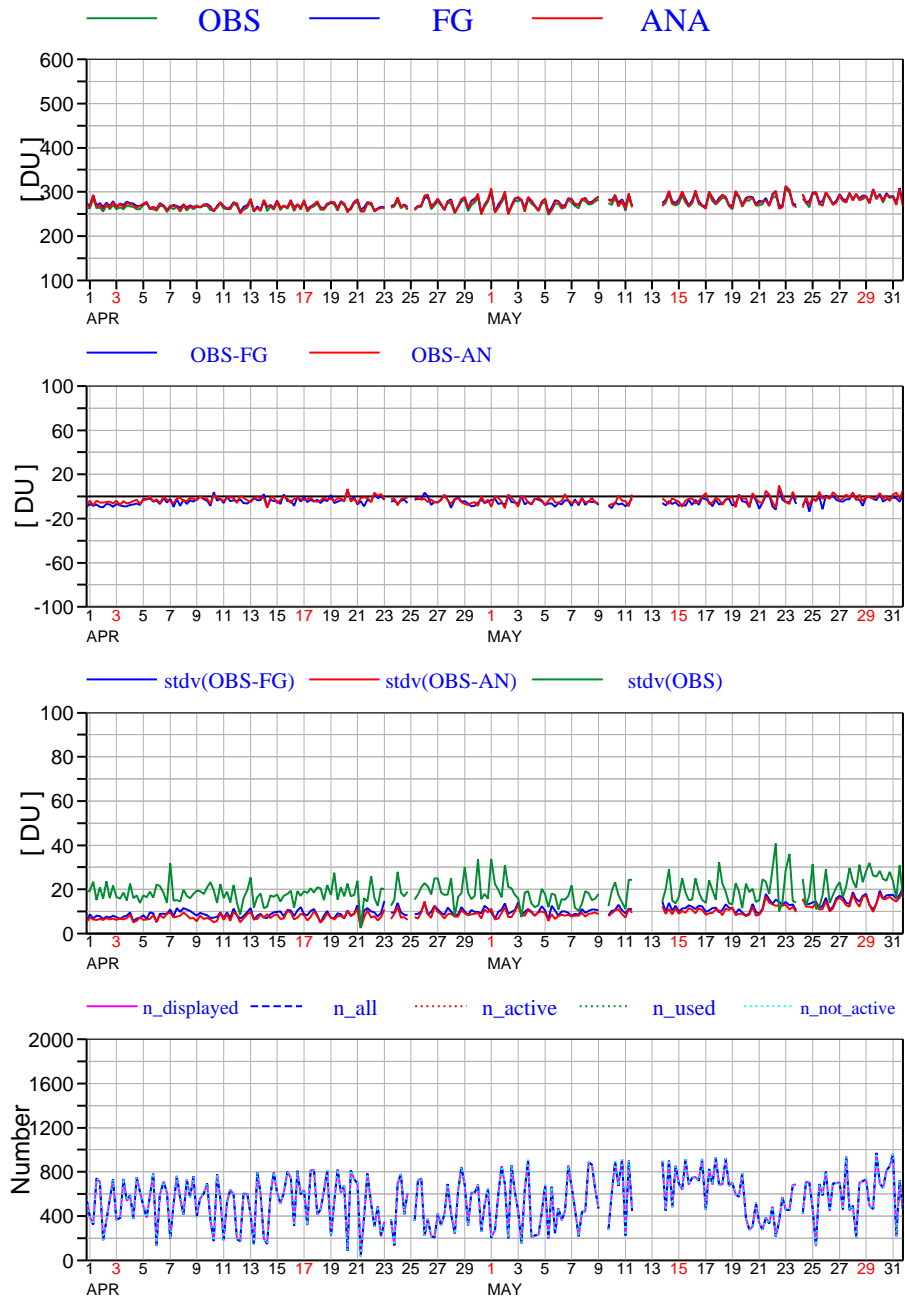
EXP = 0001, Data Period = 2005033118 - 2005053118

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 = 2005033118 - 2005053118
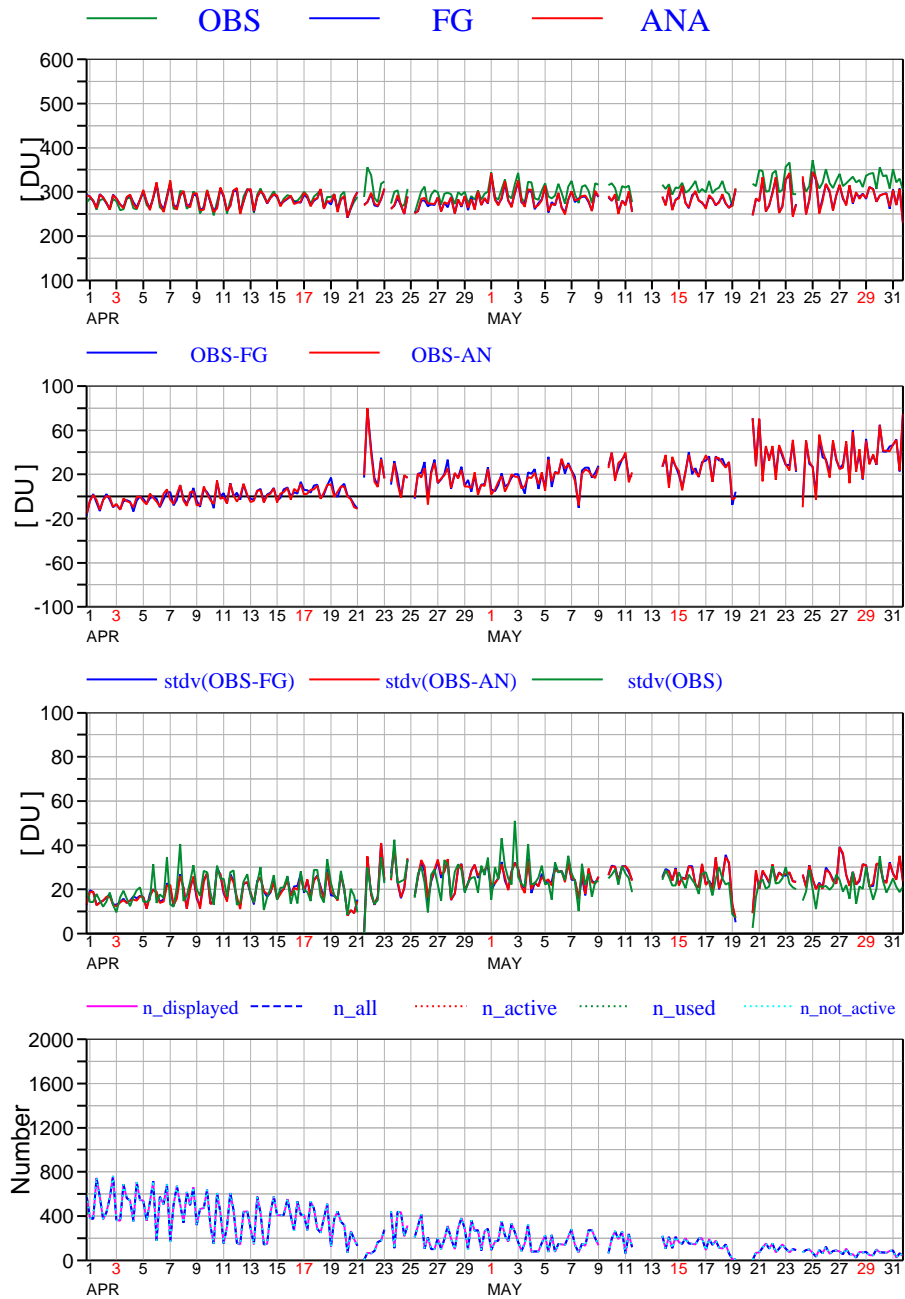

Fig. 6. As Fig. 1 but for 60-90S.

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY
NUMBER OF OBSERVATIONS PER GRID SQUARE
DATA PERIOD = 2005050100 - 2005053118
EXP = 0001, LAYER = 01, 0.10 - 1013.25 HPA
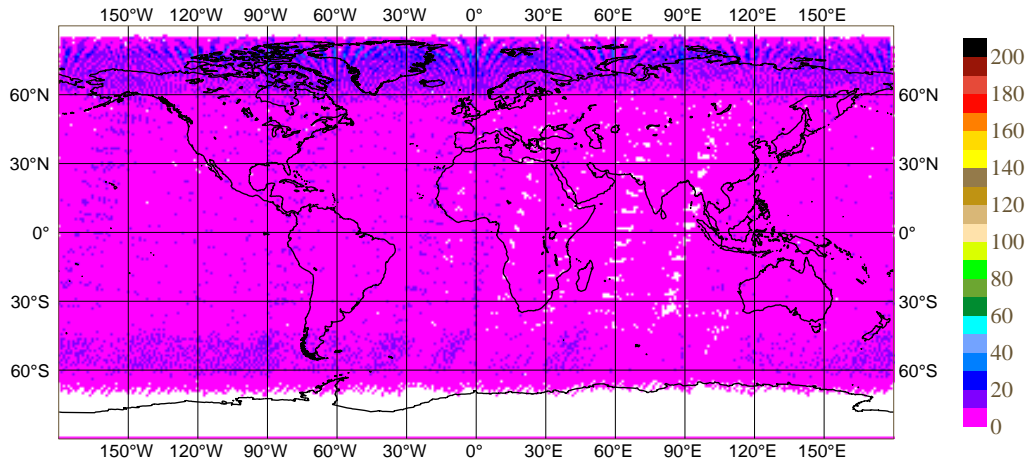Min: 1   Max: 48   Mean: 6.2504

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

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY
MEAN OBSERVATION [DU]
DATA PERIOD = 2005050100 - 2005053118
EXP = 0001, LAYER = 01, 0.10 - 1013.25 HPA
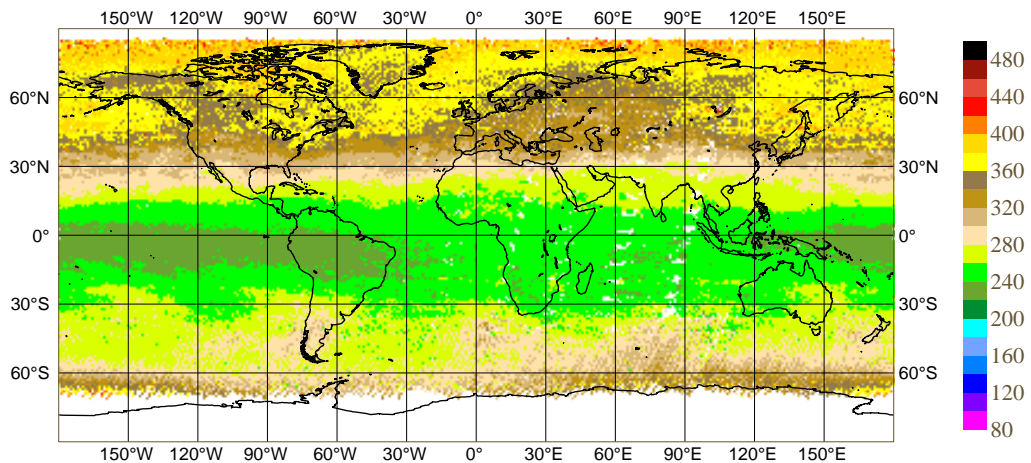Min: 224.16   Max: 457.89   Mean: 311.4

Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for May 2005.
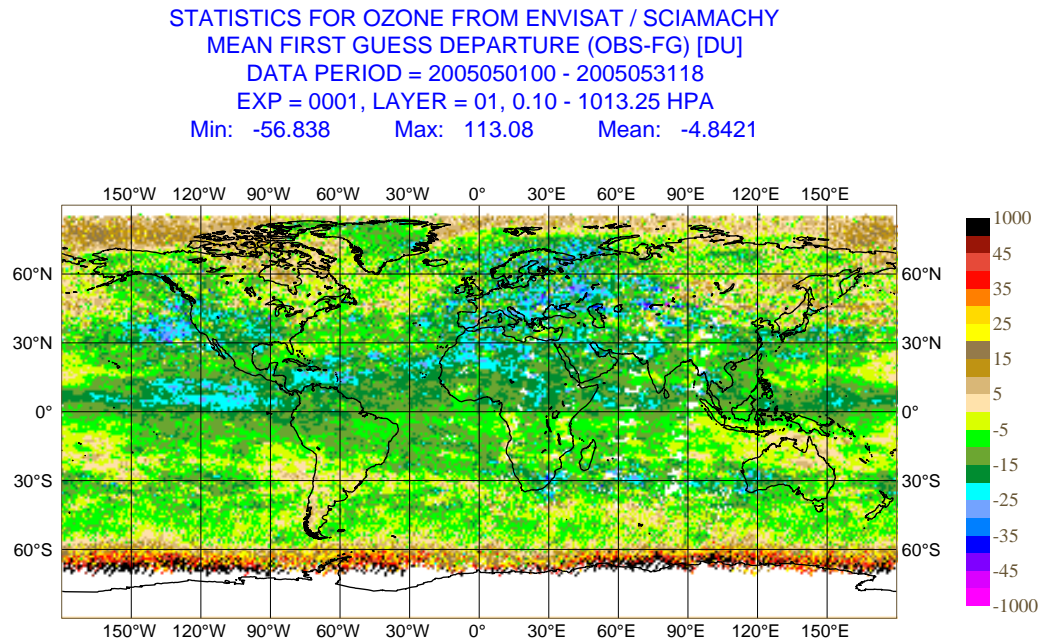
9

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY
MEAN FIRST GUESS DEPARTURE (OBS-FG) [DU]
DATA PERIOD = 2005050100 - 2005053118
EXP = 0001, LAYER = 01, 0.10 - 1013.25 HPA
Min: -56.838   Max: 113.08   Mean: -4.8421

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

STATISTICS FOR OZONE FROM ENVISAT / SCIAMACHY
LAYER = 01, 0.10 - 1013.25 HPA
NUMBER OF OBSERVATIONS IN AVERAGE
EXP = 0001, DATA PERIOD = 2005033118 - 2005053118
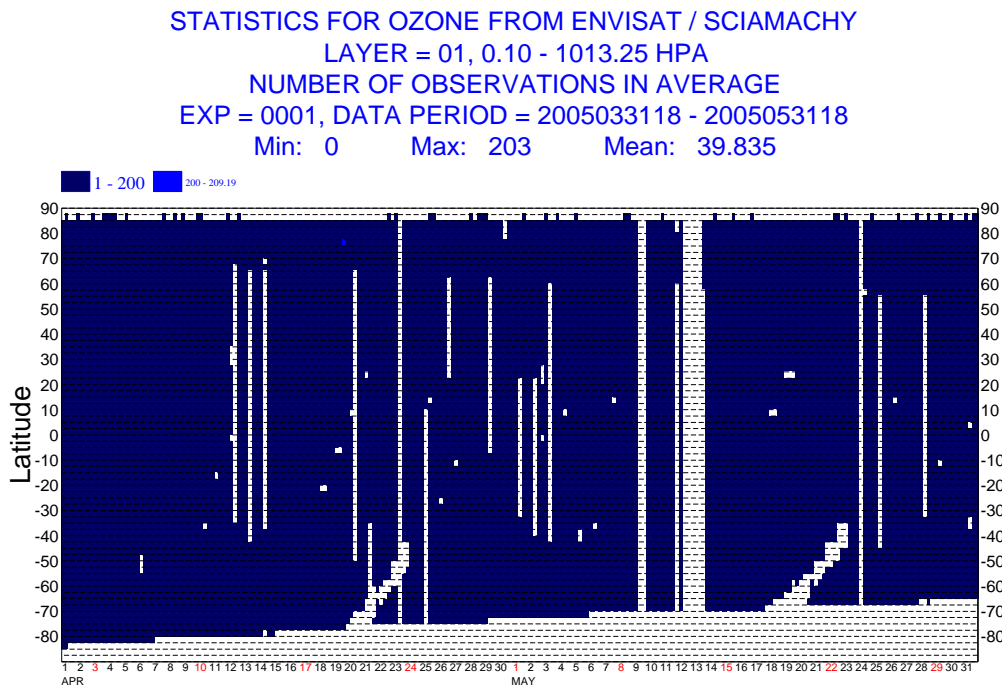Min: 0   Max: 203   Mean: 39.835

Fig. 10. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for April and May 2005.
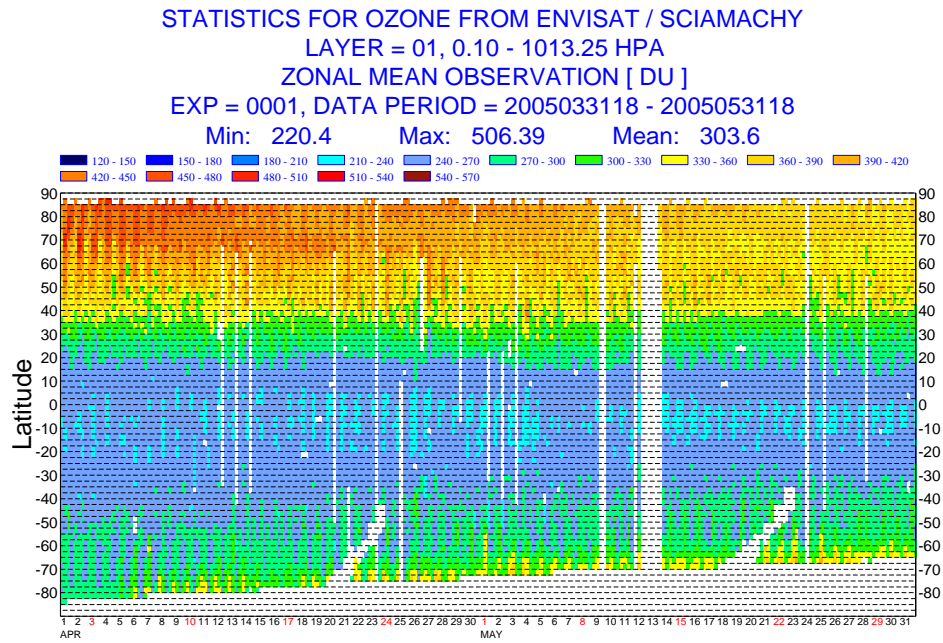
Fig. 11. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for April and May 2005.
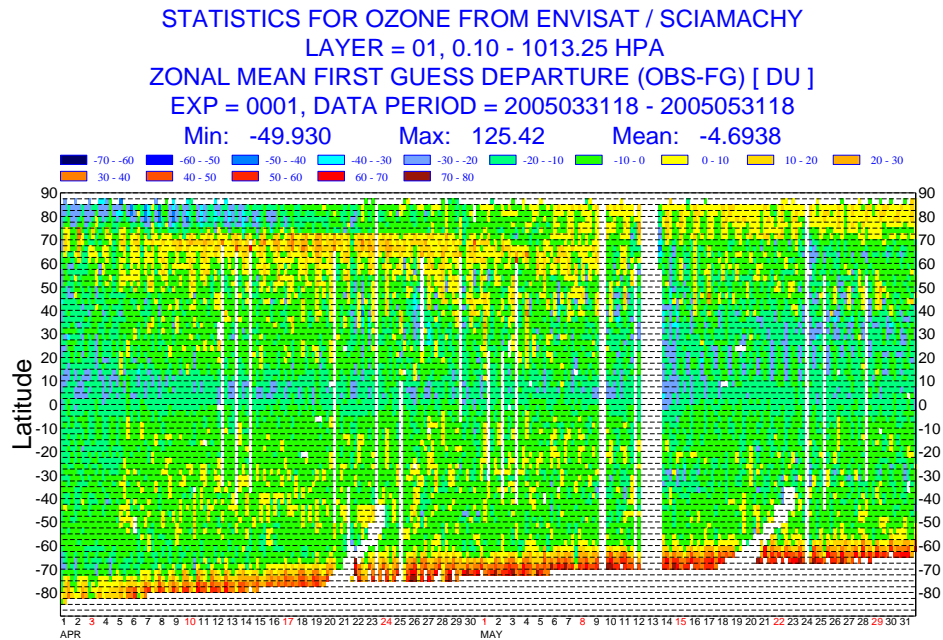

Fig. 12. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for April and May 2005.
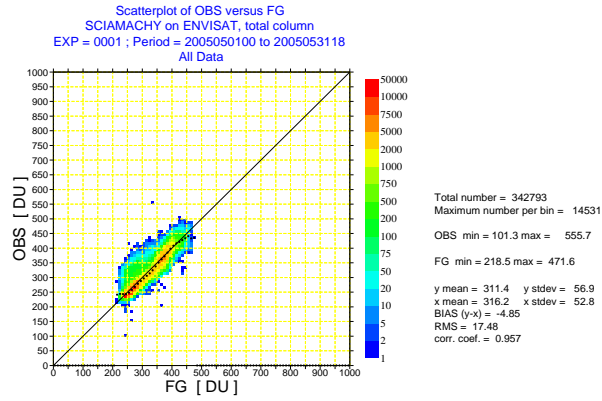
Fig. 13. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for May 2005. The colours show the number per bin, the black dots the mean values per bin.
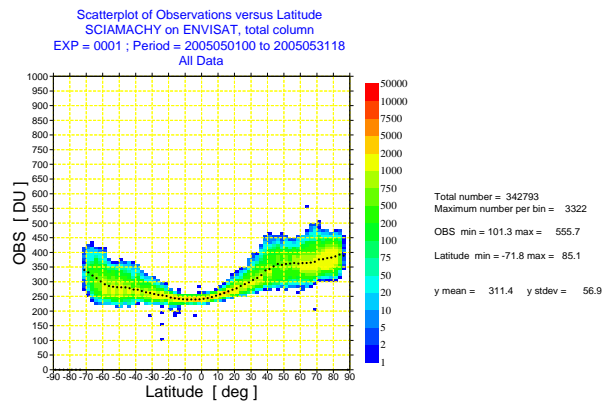

Fig. 14. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for May 2005. The colours show the number per bin, the black dots the mean values per bin.
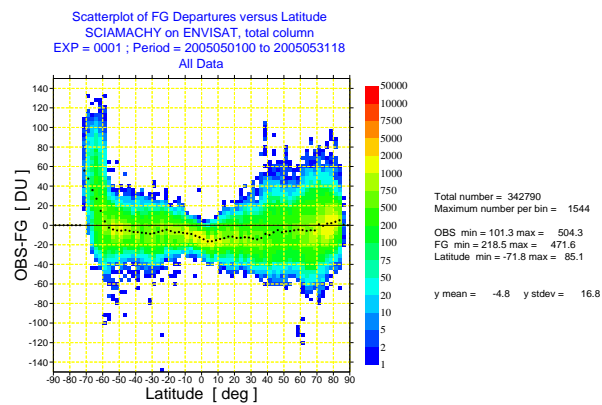

Fig. 15. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for May 2005. The colours show the number per bin, the black dots the mean values per bin.