REPORT ABOUT ENVISAT SCIAMACHY NRT OZONE PRODUCT (SCI_RV__2P) FOR APRIL 2005

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1. Key points for April 2005

- SCIAMACHY data quality stable in April.
- SCIAMACHY data about 5 DU lower in the global mean than ECMWF ozone values.
- Decrease of the standard deviations of SCIAMACHY data at the northern high latitudes.
- On 5 April the operational ECMWF model changed from version CY28R4 to CY29R1.

2. Quality and amount of received data

This report covers SCIAMACHY NRT total column ozone data for April 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 April. The global mean departures (SCIAMACHY-ECMWF) have decreased from values around -10 DU in March to values around -5 DU in April. A slight drift in the mean departures can be seen at the high southern latitudes from 5 April to 22 April, after this period positive bias up to 30 DU are observed. Note however the small sample size to compute the mean values over the southern high latitudes.

The standard deviations of the first-guess and analysis departures are also stable in April. In the global mean those values are the same as in March (15 DU). After 5 April the standard deviations of SCIAMACHY data at the northern/southern high latitudes are smaller/larger compared to the previous month.

From the geo plots, the hovmoeller plots and the scatter plots (Figures 7-15) one can see that the large positive departures observed at the northern high latitudes in March have disappeared. However positive bias have increased at the southern high latitudes and around 70N. The largest positive departures concentrated at the southern high latitudes are likely to occur at high solar zenith angles.

3. Remarks

This monitoring report was produced with the operational ECMWF model (CY28R4 and CY29R1). On 5 April the operational model changed from version CY28R4 to CY29R1. The impact of the new model cycle on the total column ozone is negligible. As in the previous cycle, 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).

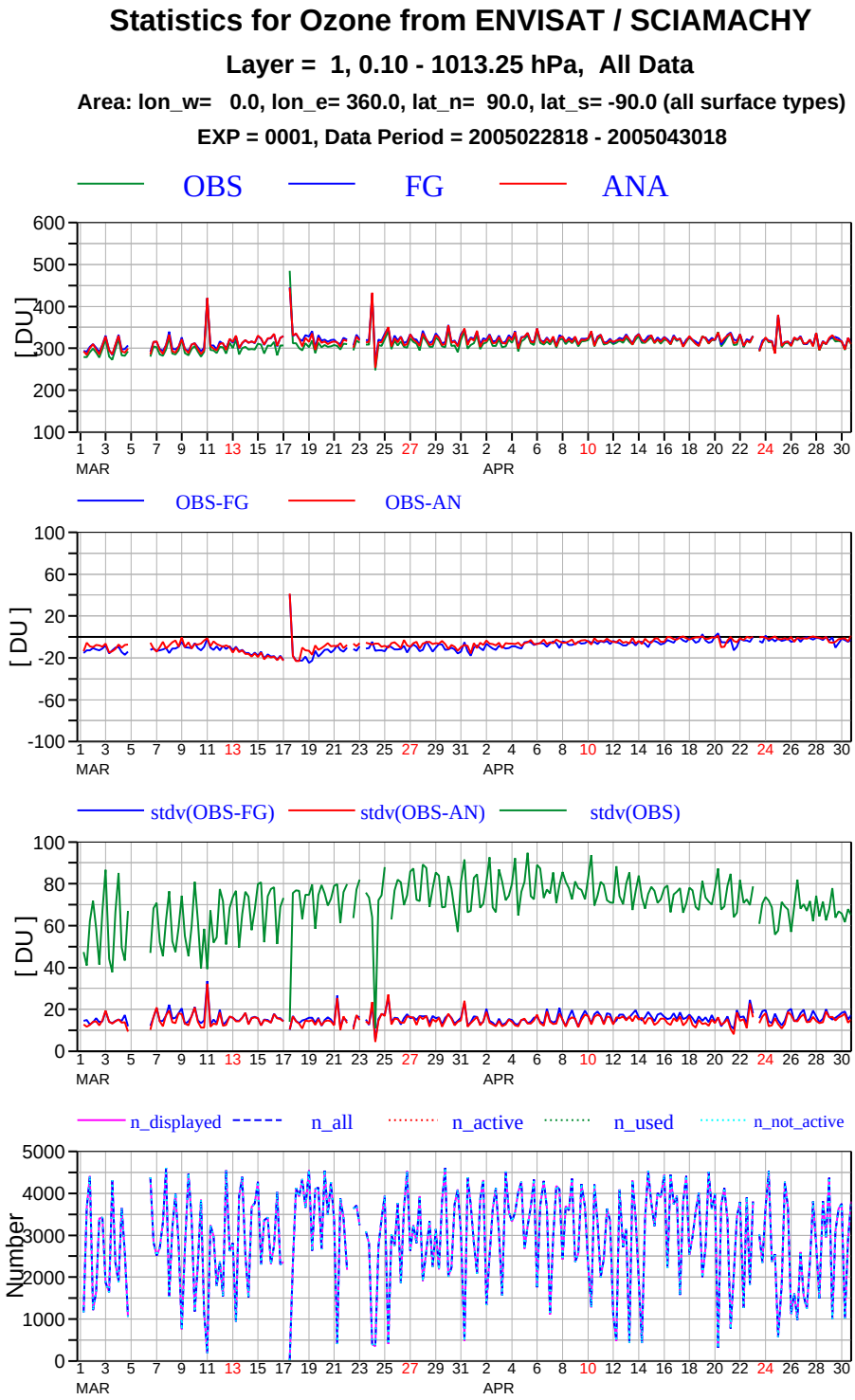

Fig. 1. Time series of mean observations, first guess and analysis values (top panel), first-guess and analysis departures (second panel), standard deviations (third panel) and number of data (bottom panel) per 6-hour cycle for ENVISAT SCIAMACHY NRT ozone data for March and April 2005 (Global means).

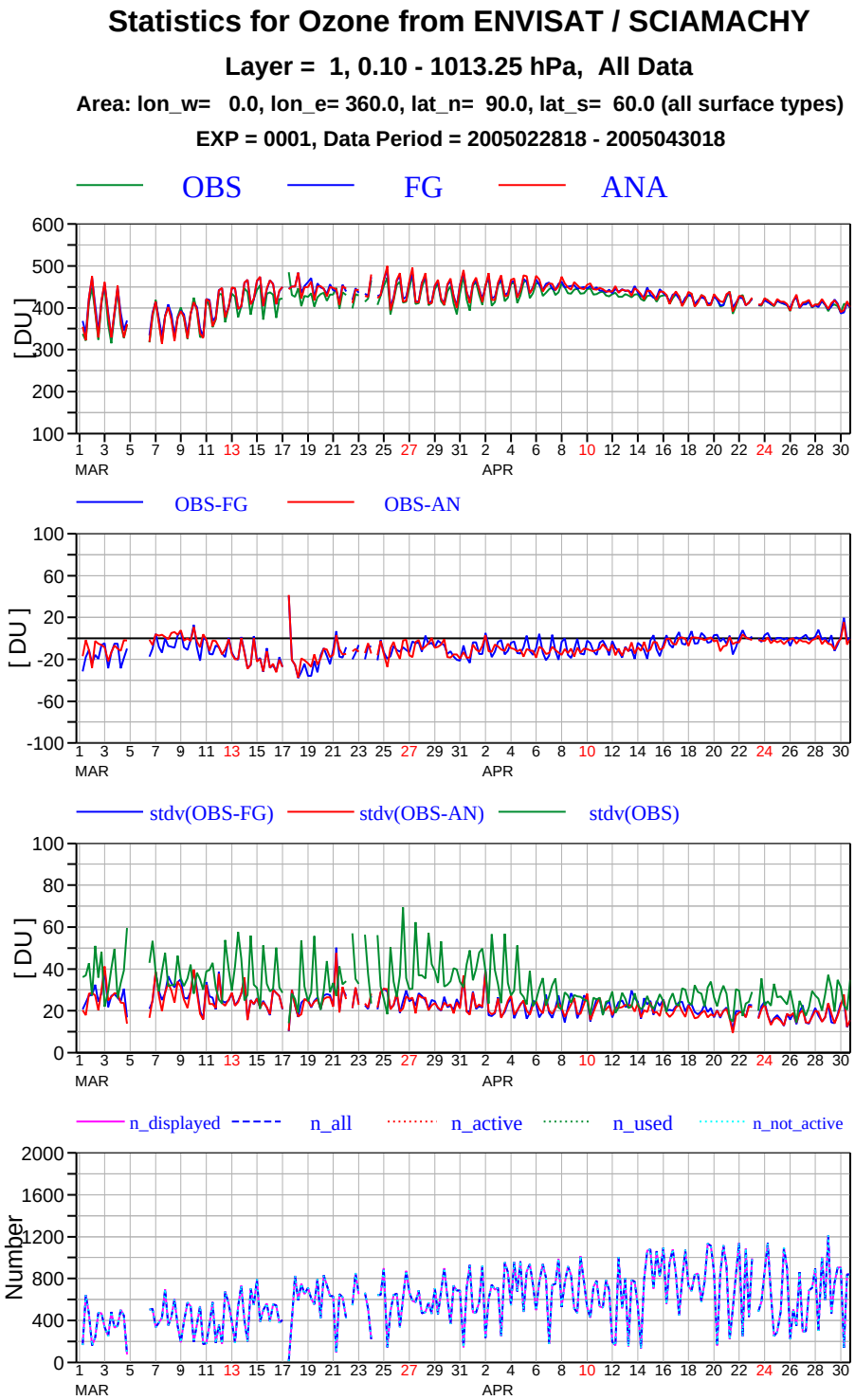

Fig. 2. As Fig.1 but for 90-60N.

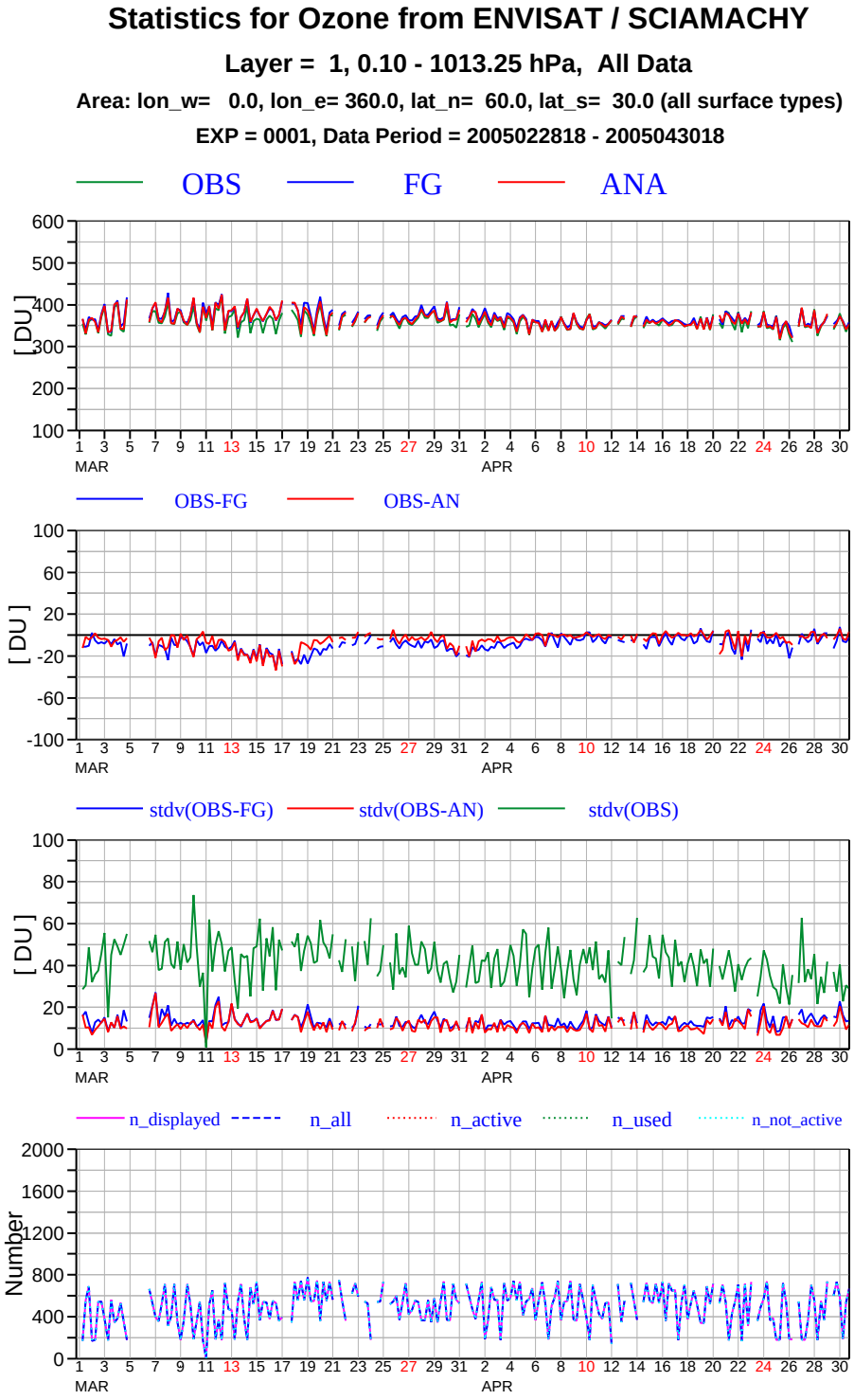

Fig. 3. As Fig. 1 but for 60-30N.

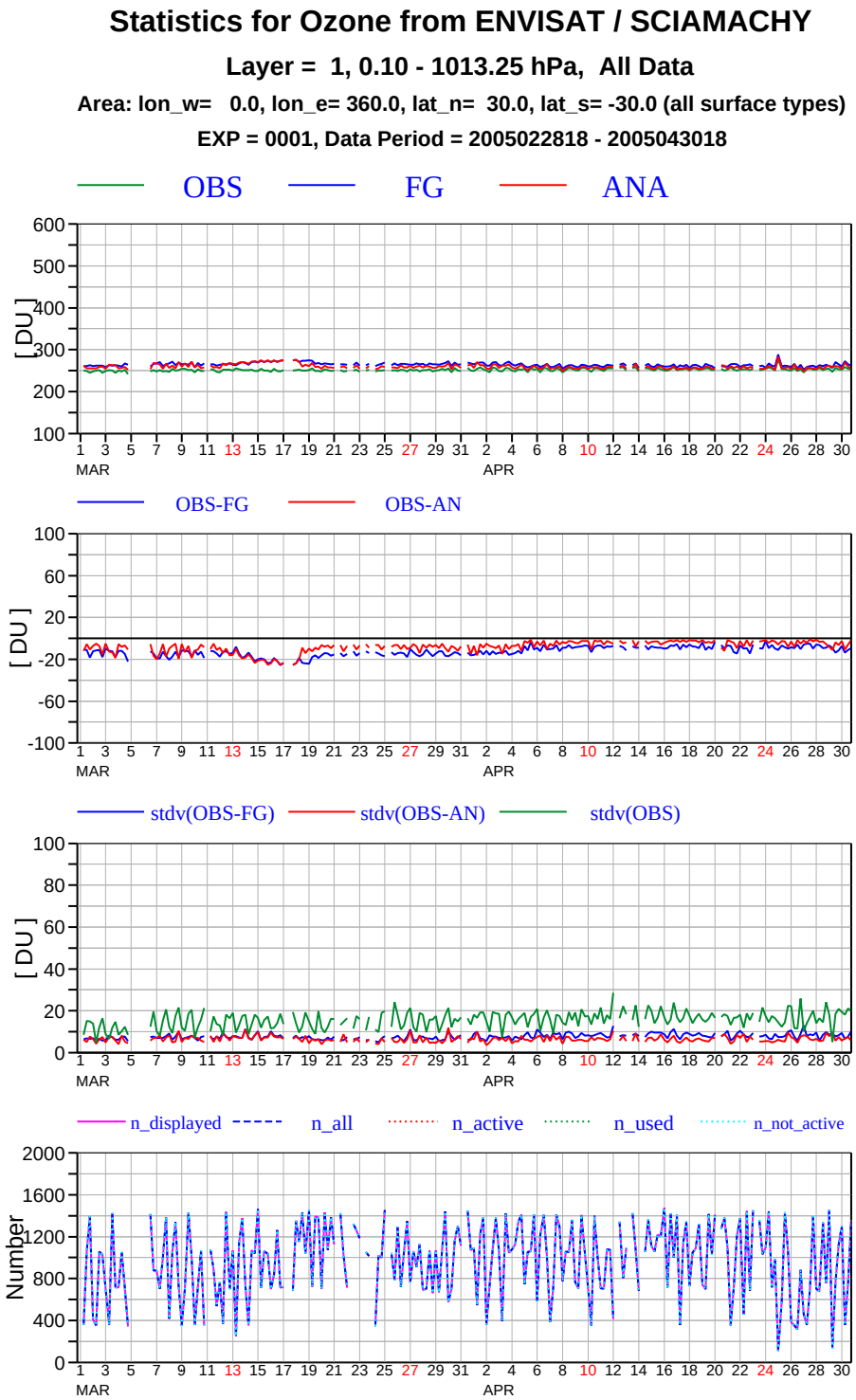

Fig. 4. As Fig. 1 but for 30N-30S.

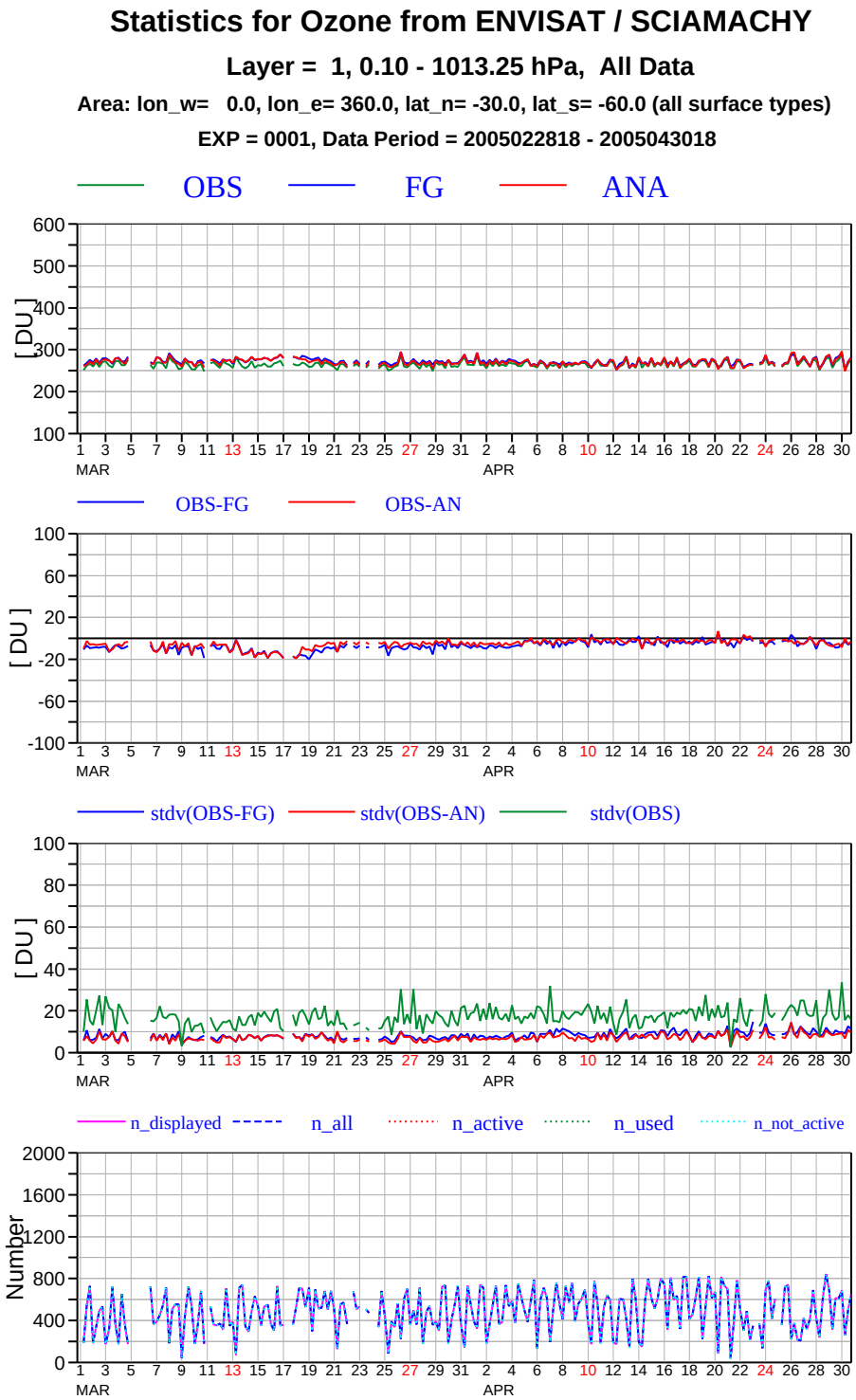

Fig. 5. As Fig. 1 but for 30-60S.

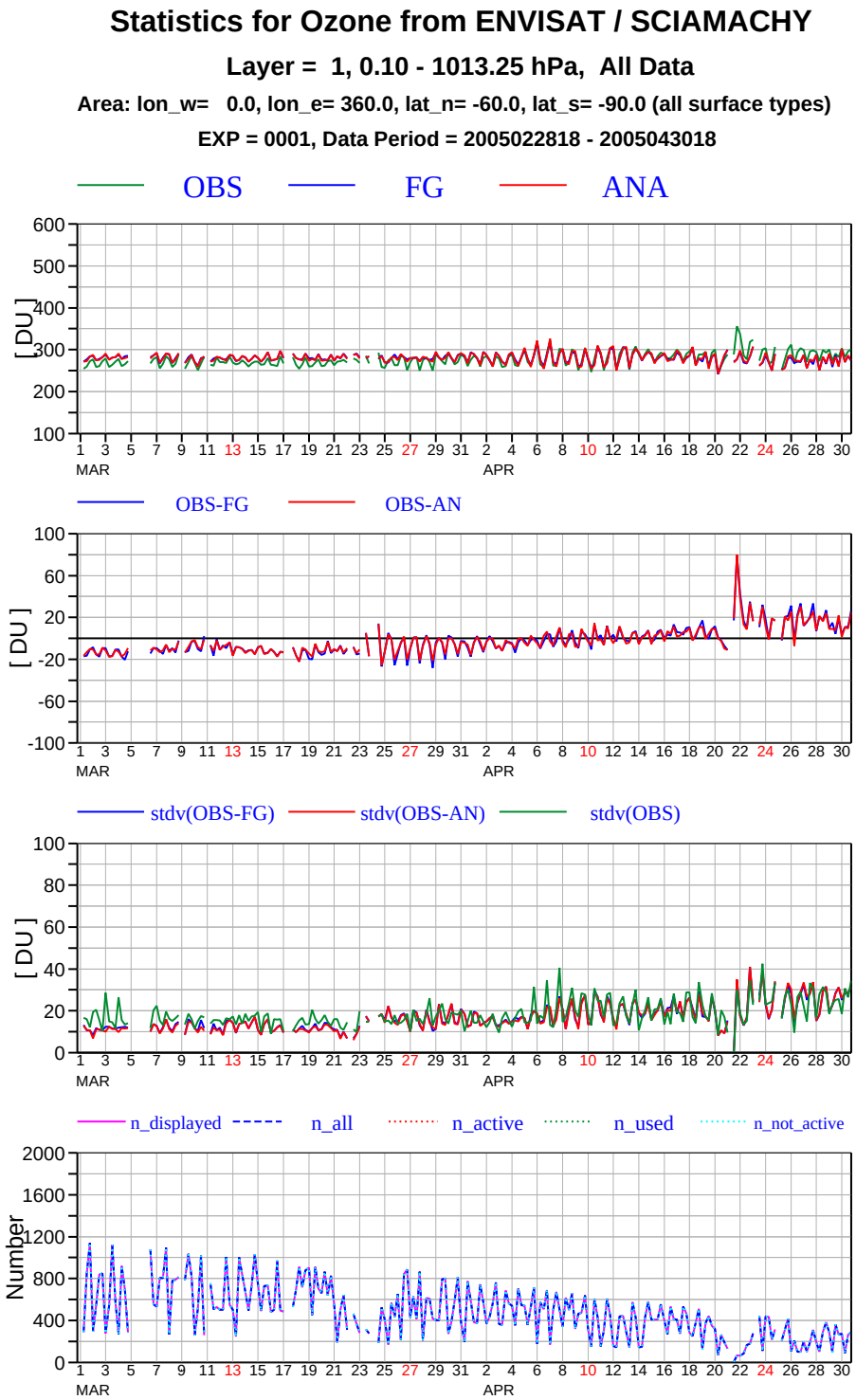

Fig. 6. As Fig. 1 but for 60-90S.

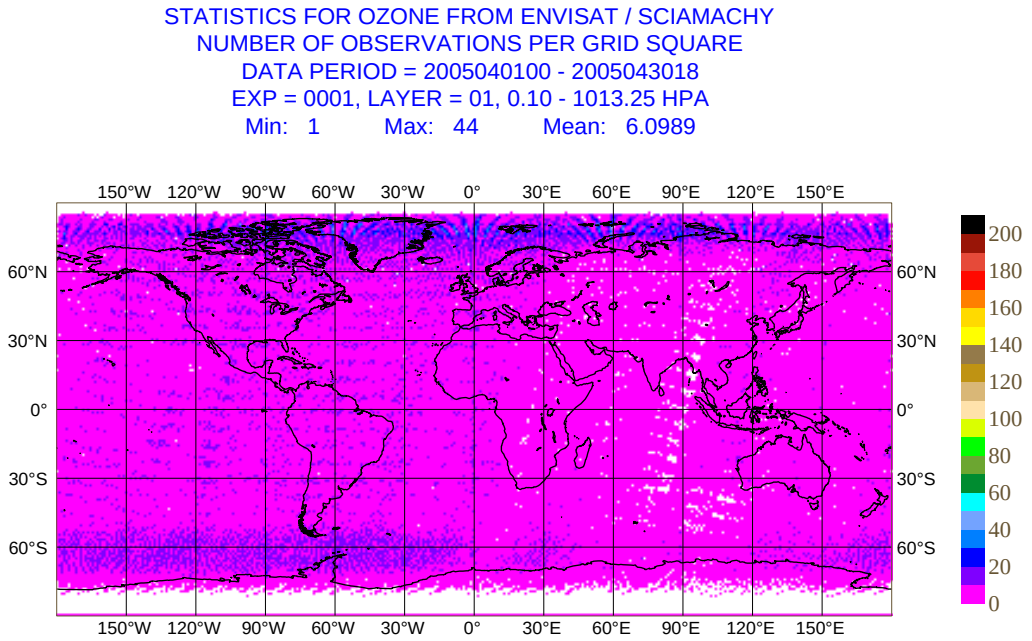

Fig. 7. Geographical distribution of mean number of data for ENVISAT SCIAMACHY NRT ozone data for April 2005.

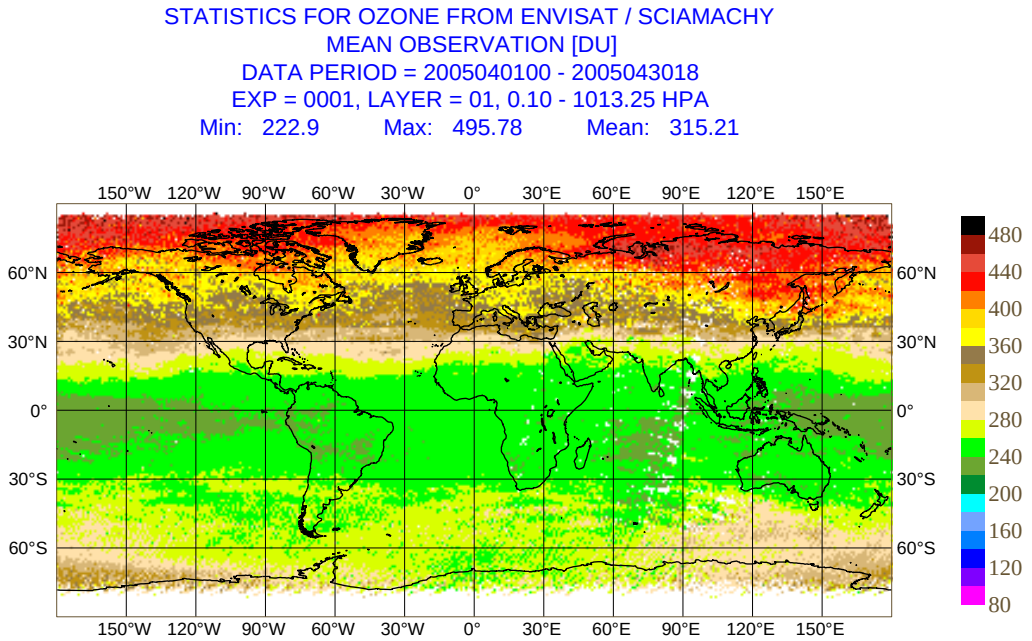

Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for April 2005.

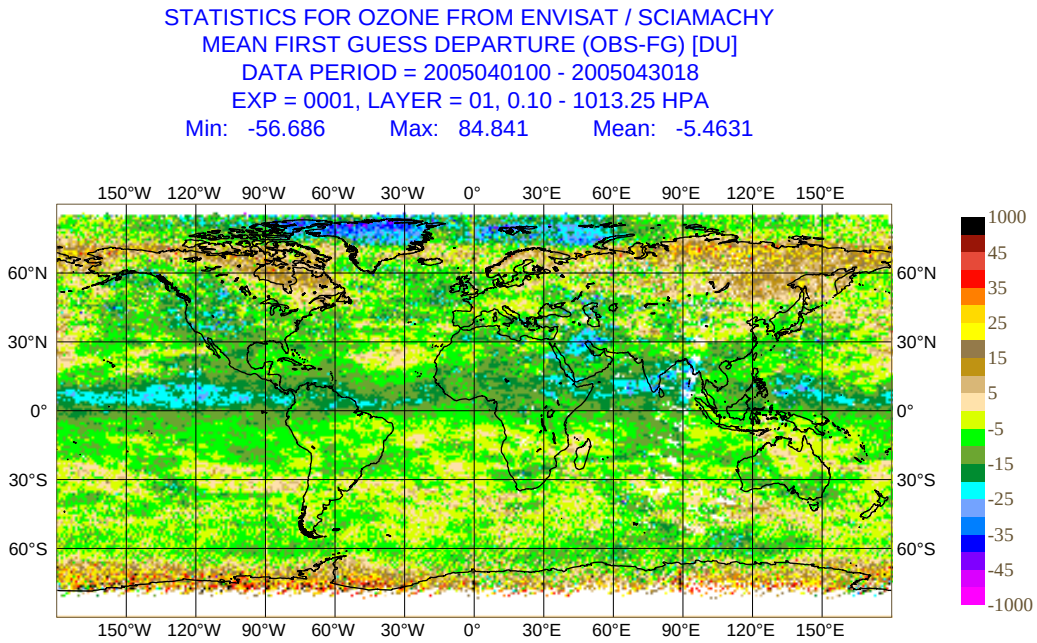

Fig. 9. Geographical distribution of mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for April 2005.

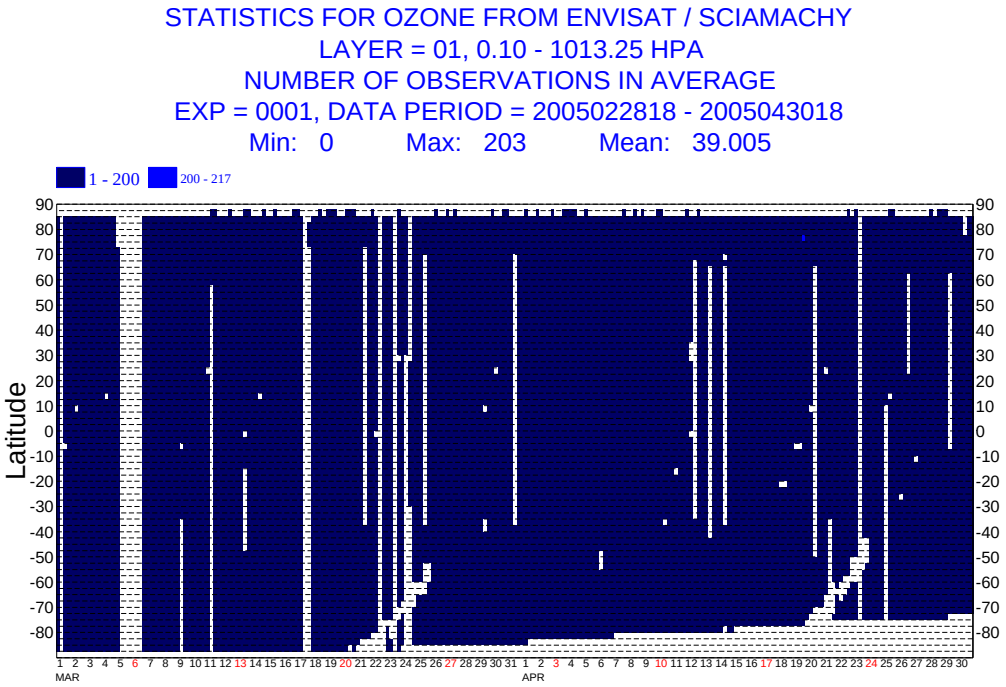

Fig. 10. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for March and April 2005.

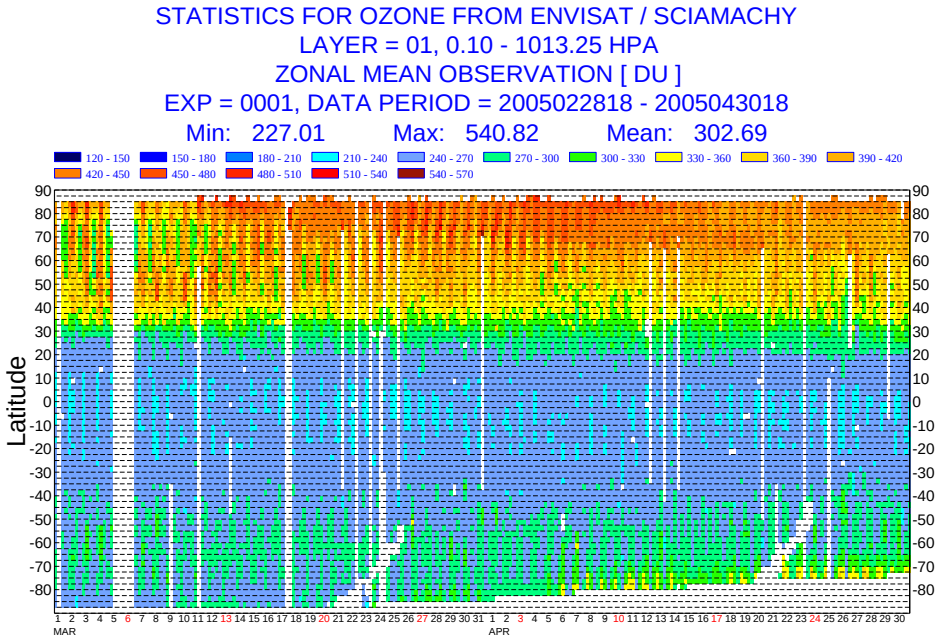

Fig. 11. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for March and April 2005.

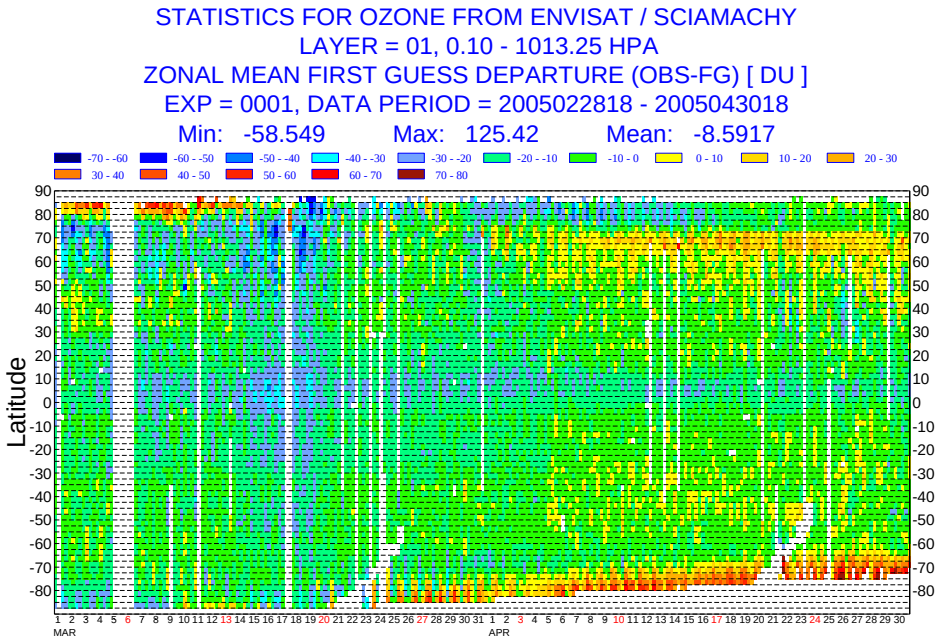

Fig. 12. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for March and April 2005.

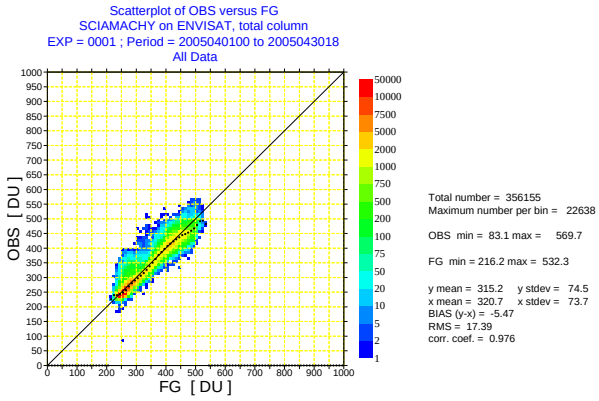

Fig. 13. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for April 2005. The colours show the number per bin, the black dots the mean values per bin.

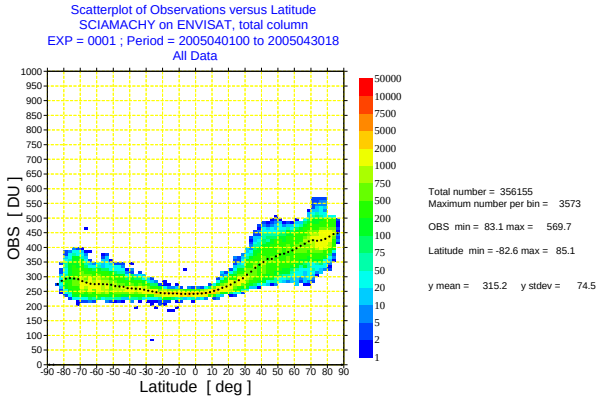

Fig. 14. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for April 2005. The colours show the number per bin, the black dots the mean values per bin.

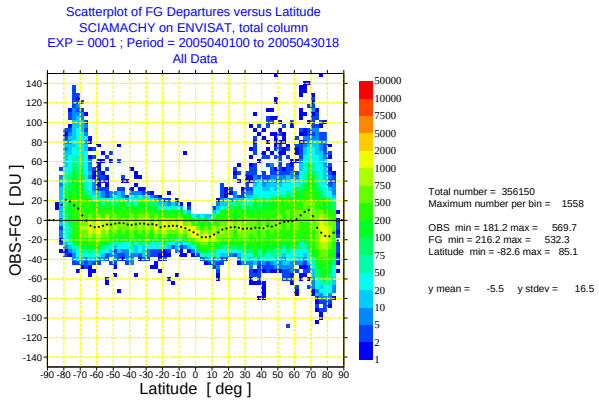

Fig. 15. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for April 2005. The colours show the number per bin, the black dots the mean values per bin.