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

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1. Key points for June 2005

- SCIAMACHY data quality stable throughout the month.
- 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.
- On 28 June the operational ECMWF model version changed from version CY29R1 to CY29R2.

2. Quality and amount of received data

This report covers SCIAMACHY NRT total column ozone data for June 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 June. Overall the global mean departures (SCIAMACHY-ECMWF) are around -5 DU, however values up to -10 DU can be observed on 5-6 June and 25-26 June when KNMI SCIAMACHY ozone data are not assimilated into the ECMWF assimilation system. Slightly larger negative biases are seen in the northern mid-latitudes (60N-30N) and in the tropics (30N-30S). The largest mean departures are observed at the high southern latitudes (60S-90S) but it must be noted that the sample size to compute the mean values over those latitudes is quite small (there are no data south of 62.5S).

The standard deviations of the first-guess and analysis departures are also stable in June. In the global mean those values are roughly around 15 DU. The smallest standard deviations of the mean departures are seen in the tropics (roughly between 5 and 10 DU), whereas the largest (up to 40 DU) are observed in the southern hemisphere (in particular at the high latitudes).

The decrease in the global mean of the standard deviations of SCIAMACHY data, observed since April, is still noticeable this month, with values ranging from 50 DU at the beginning of the month to 30 DU at the end.

The geo plots, the hovmoeller plots and the scatter plots (Figures 7-15) also show that the largest (positive) biases 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 (CY29R1 and CY29R2). On 28 June the operational model changed from version CY29R1 to version CY29R2. The impact of the new model cycle on the total column field is neutral. In cycles CY29R1 and 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).

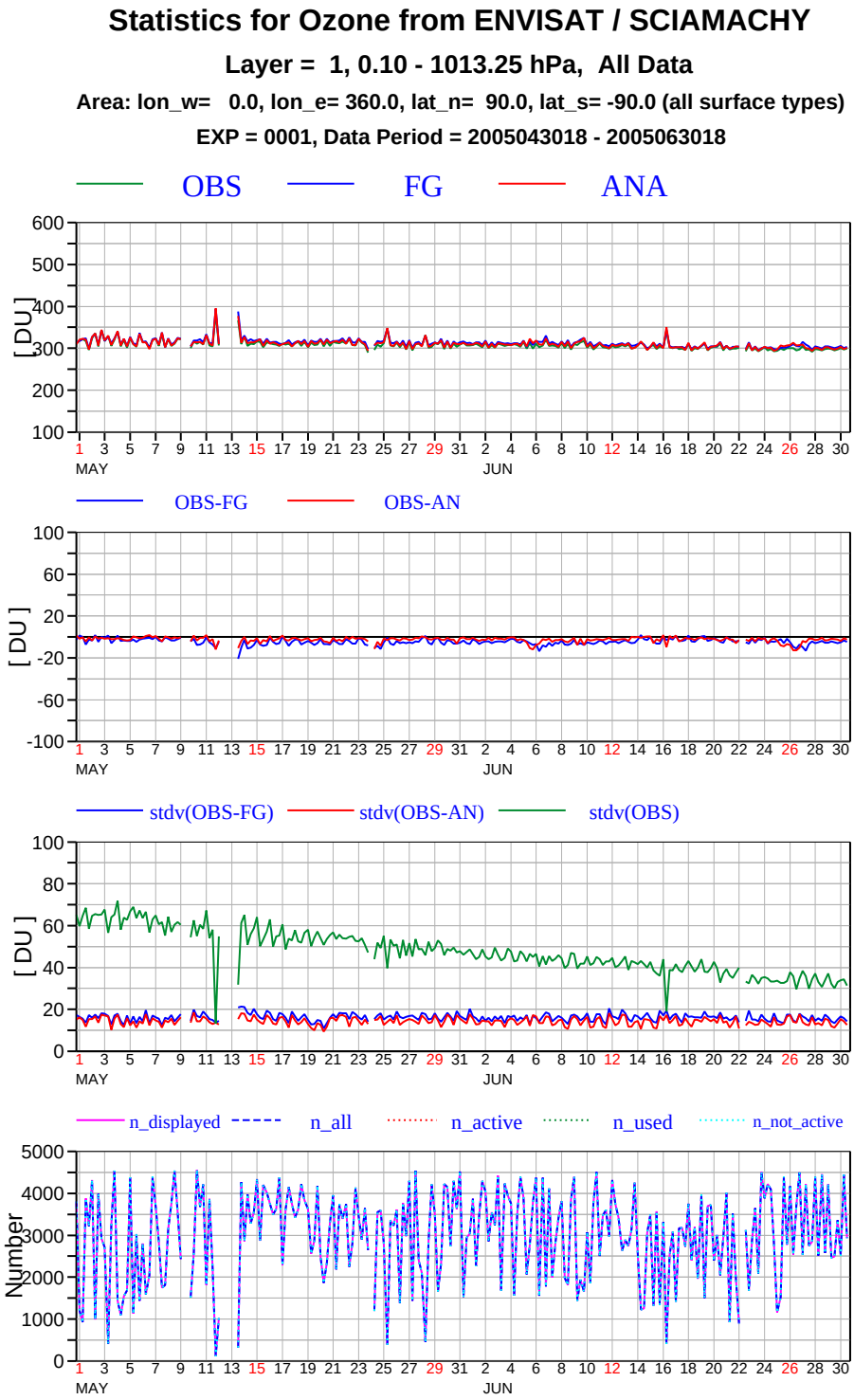

Fig. 1. Time series of mean observations, first guess and analysis values (top panel), first-guess and analysis departures (second panel), standard deviations (third panel) and number of data (bottom panel) per 6-hour cycle for ENVISAT SCIAMACHY NRT ozone data for May and June 2005 (Global means).

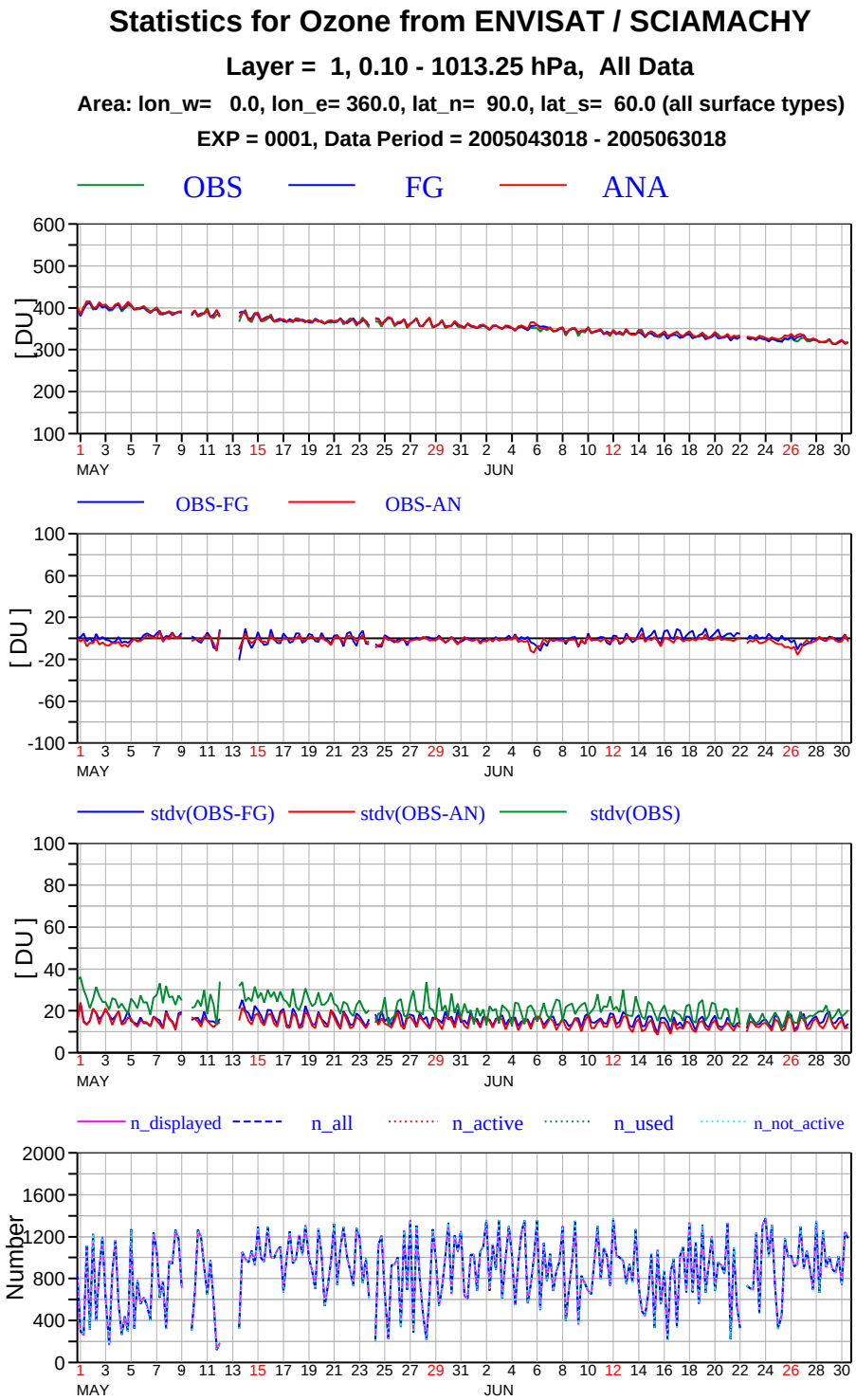

Fig. 2. As Fig.1 but for 90-60N.

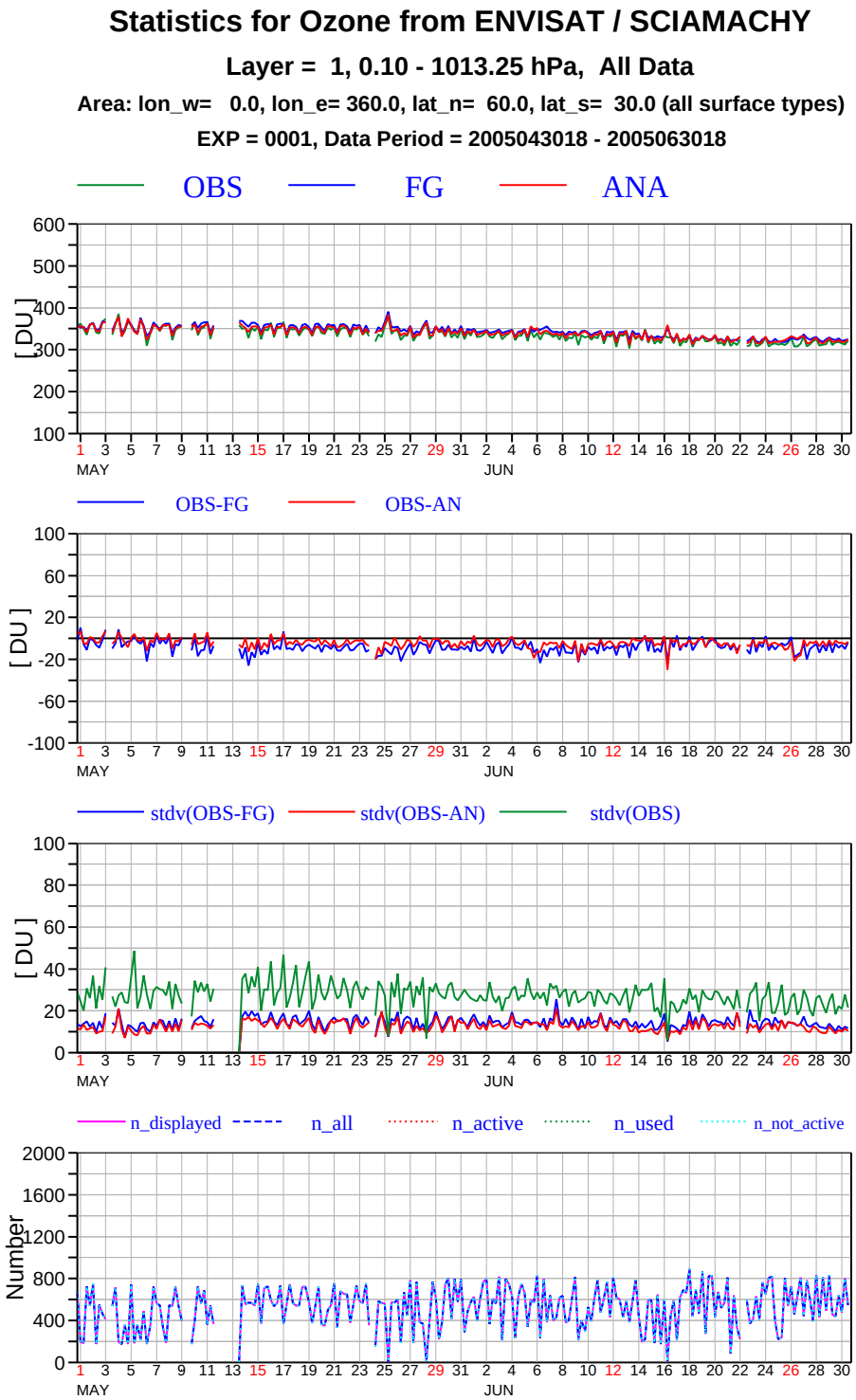

Fig. 3. As Fig. 1 but for 60-30N.

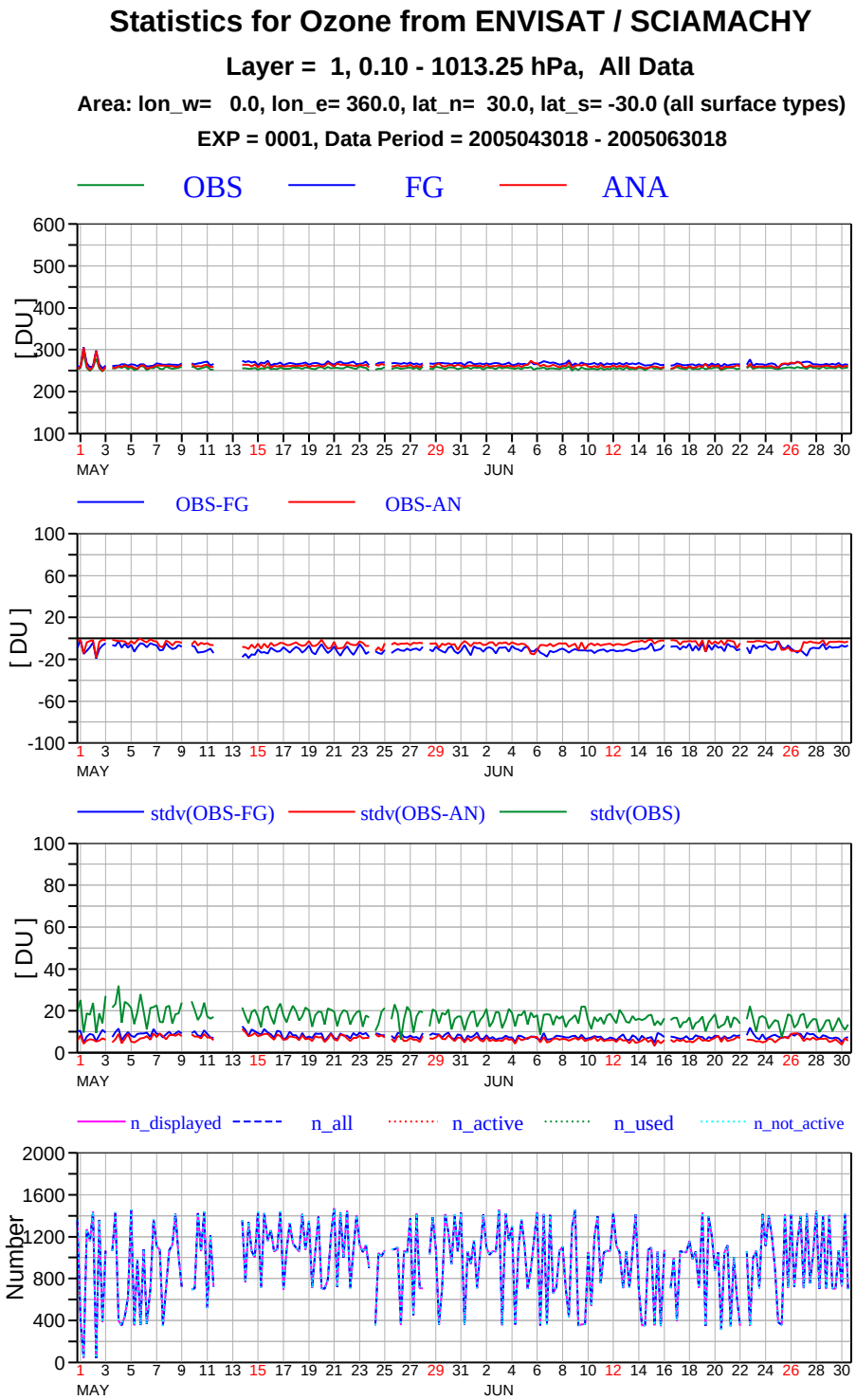

Fig. 4. As Fig. 1 but for 30N-30S.

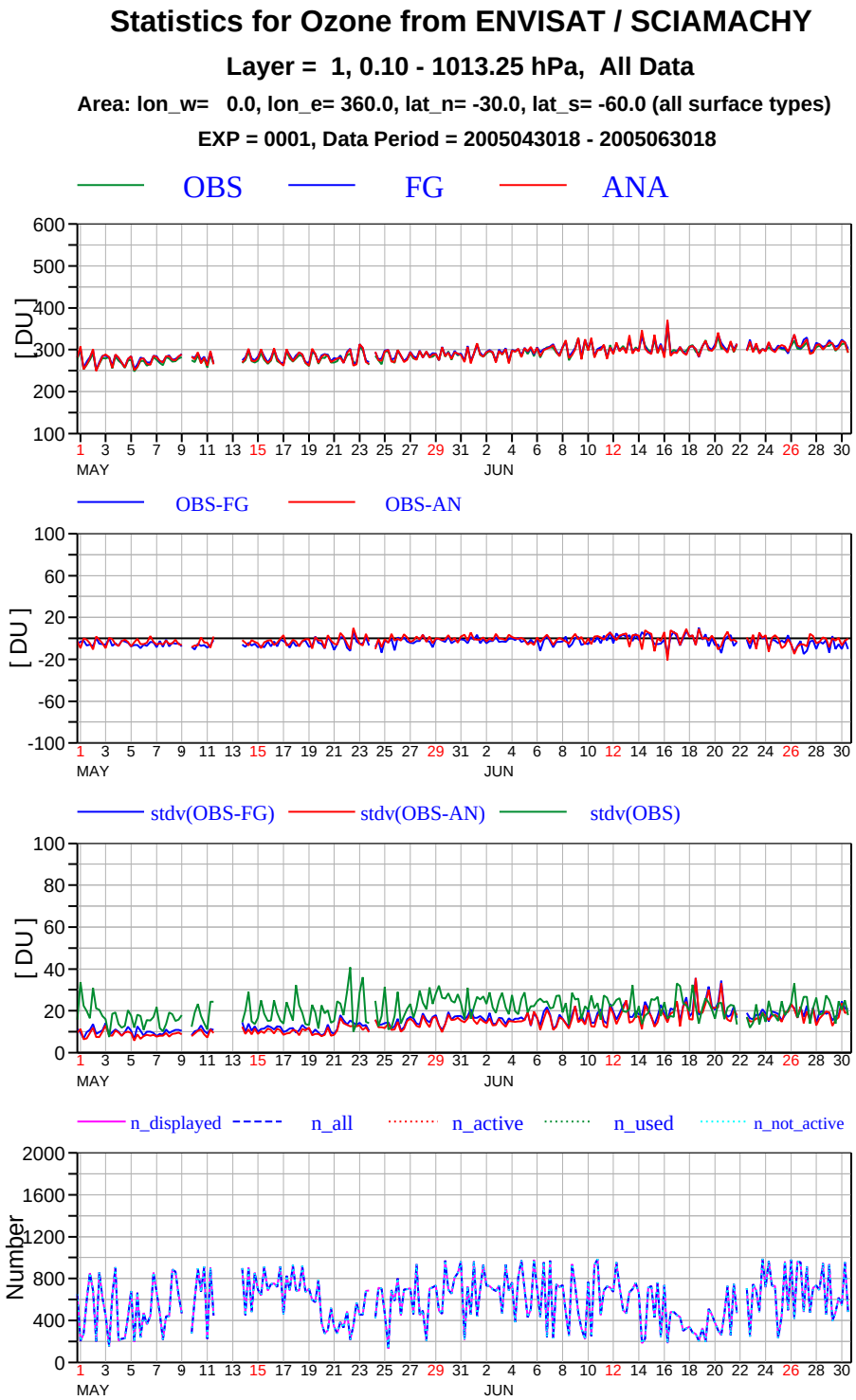

Fig. 5. As Fig. 1 but for 30-60S.

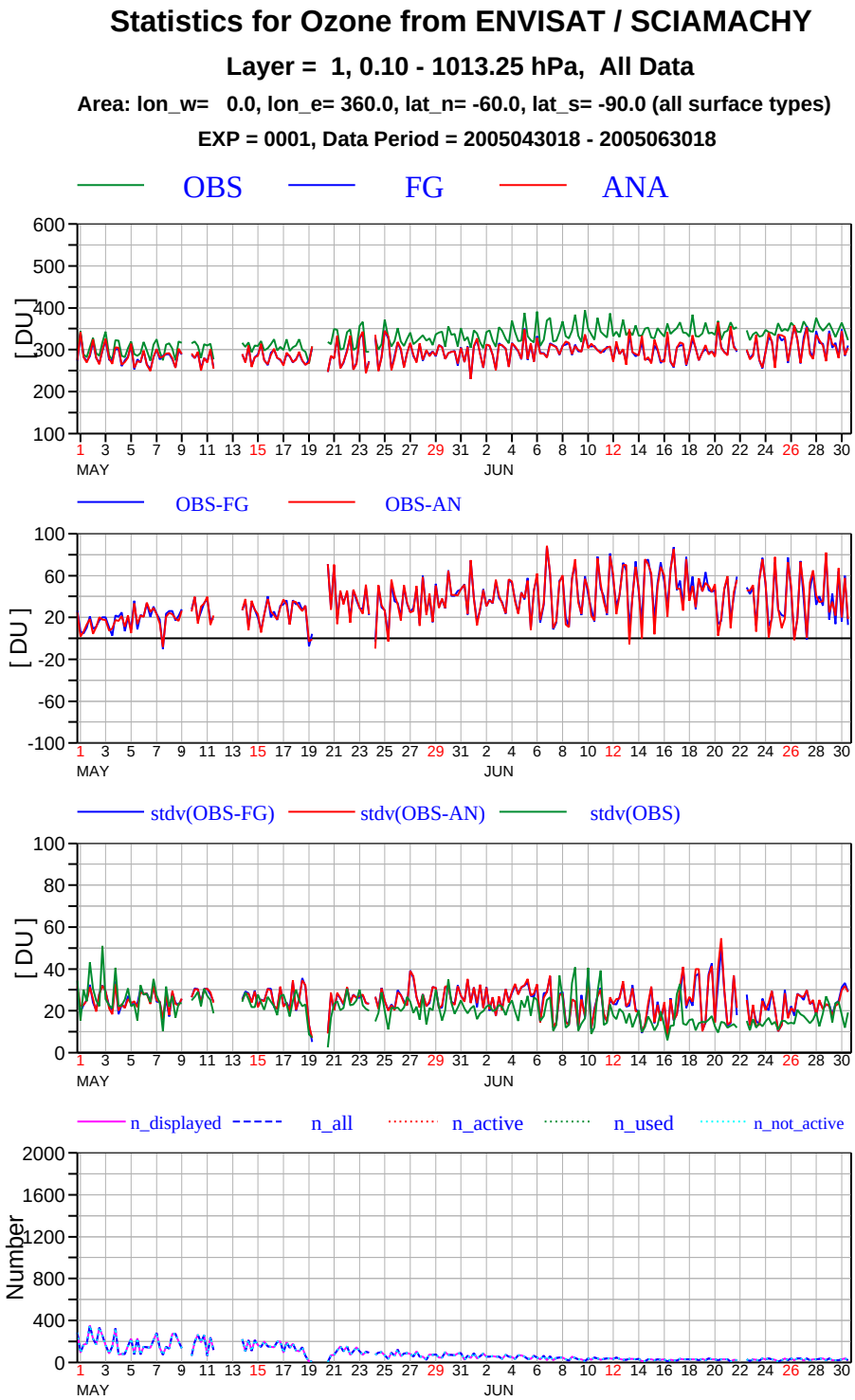

Fig. 6. As Fig. 1 but for 60-90S.

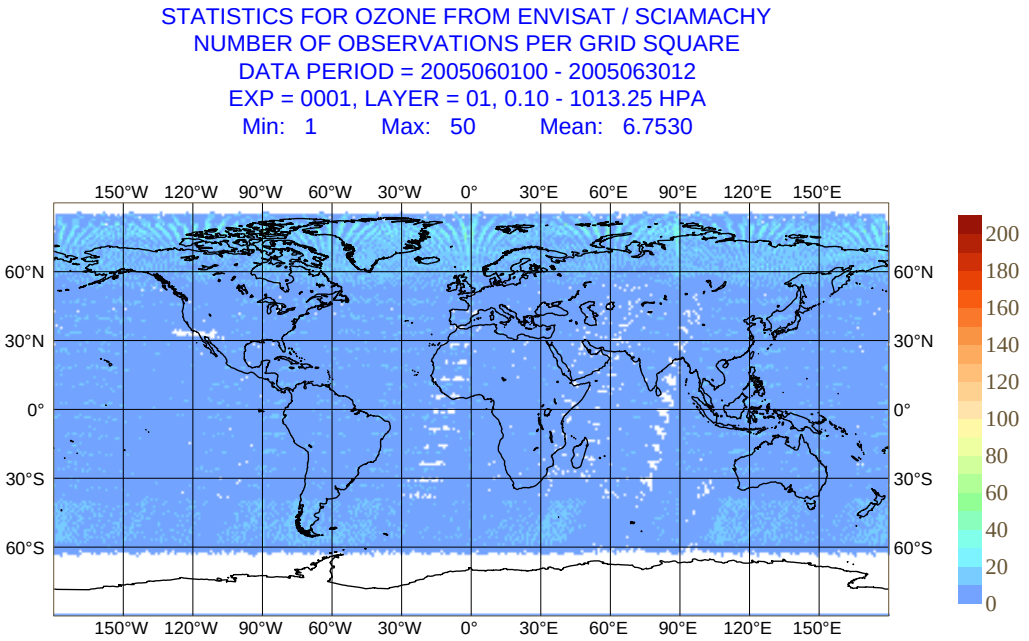

Fig. 7. Geographical distribution of mean number of data for ENVISAT SCIAMACHY NRT ozone data for June 2005.

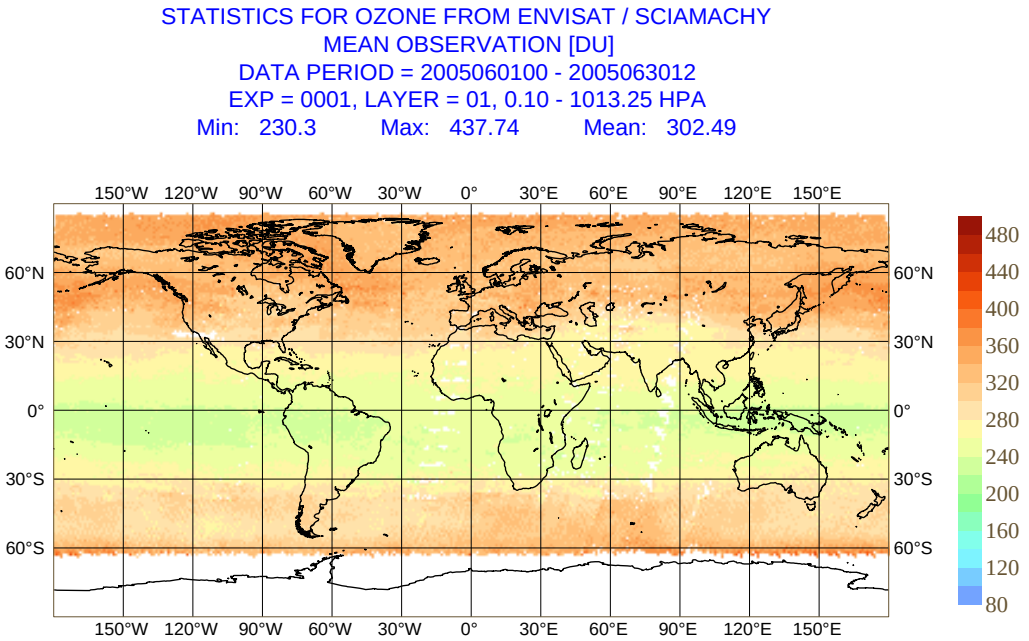

Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for June 2005.

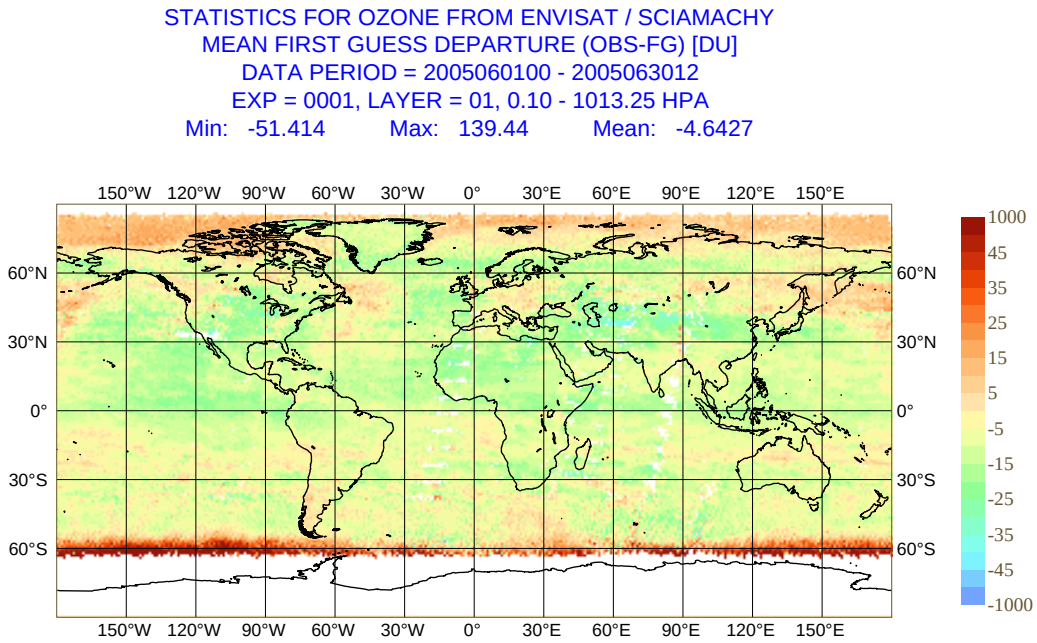

Fig. 9. Geographical distribution of mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for June 2005.

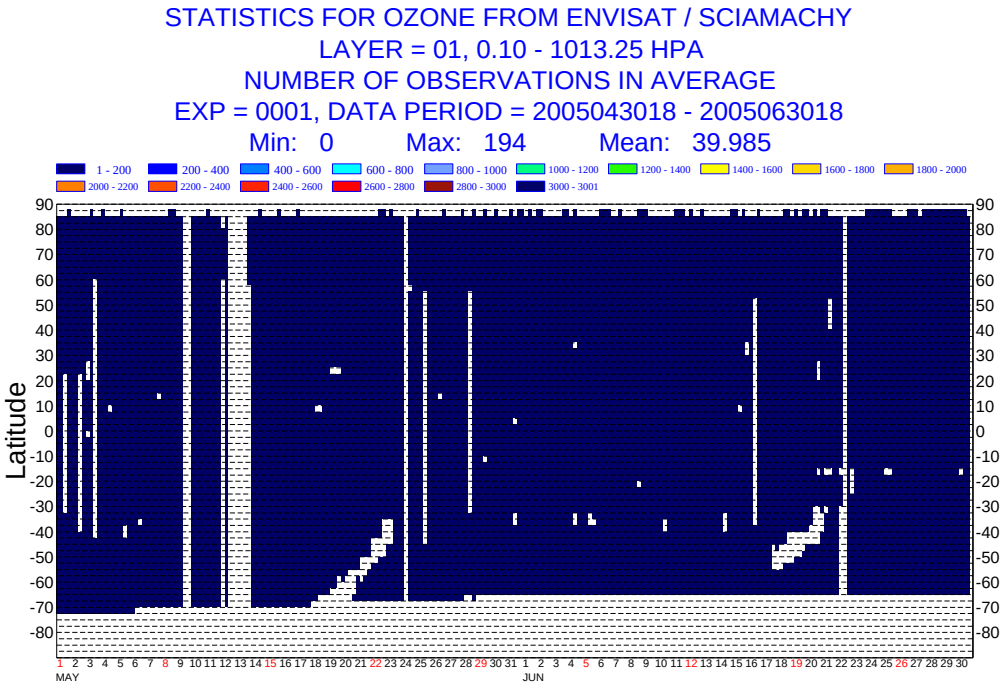

Fig. 10. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for May and June 2005.

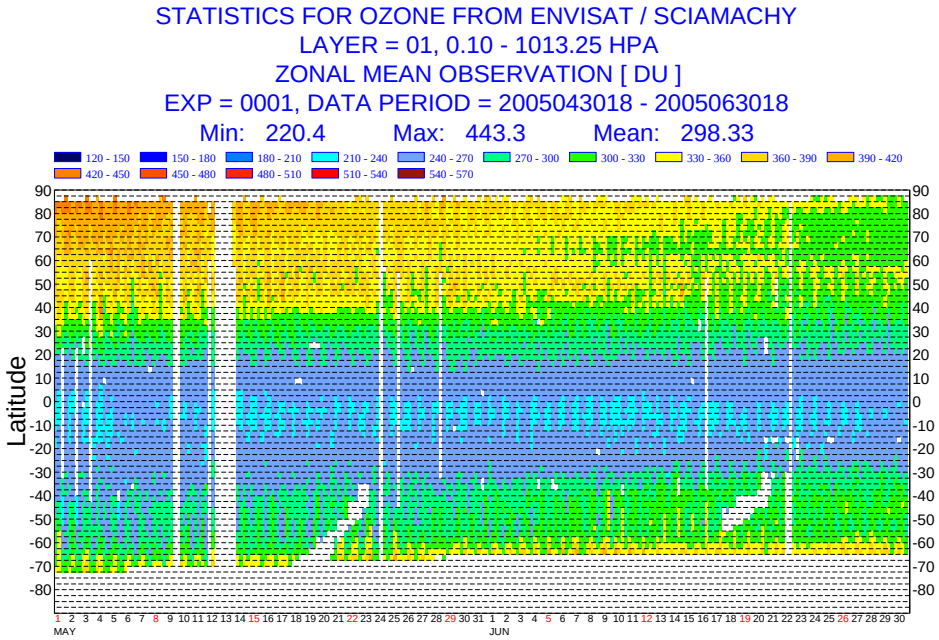

Fig. 11. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for May and June 2005.

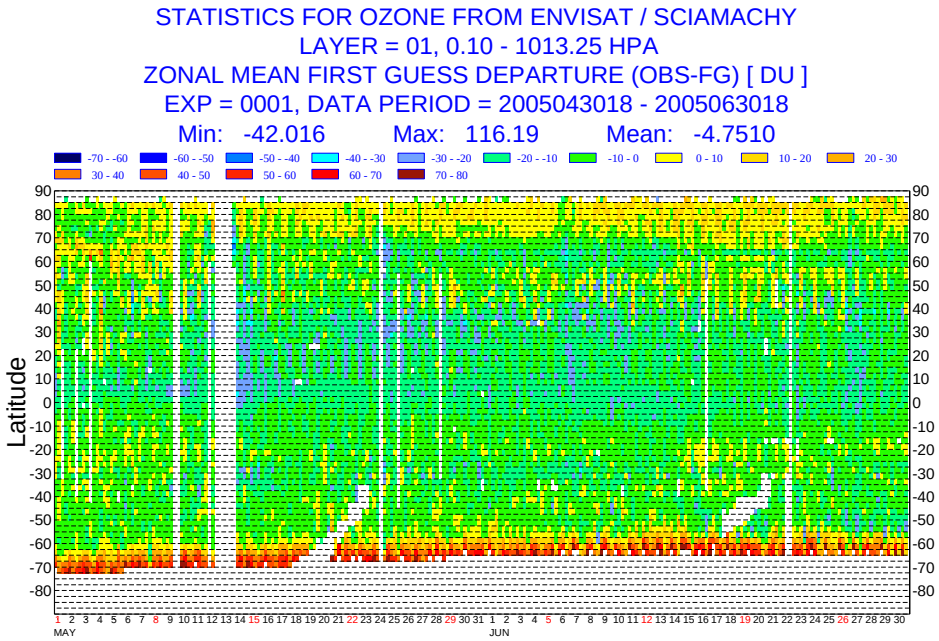

Fig. 12. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for May and June 2005.

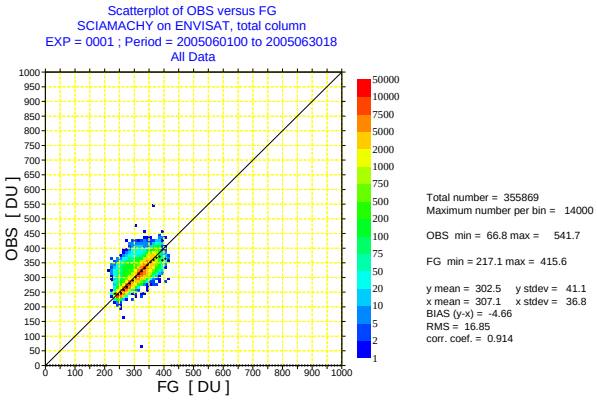

Fig. 13. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for June 2005. The colours show the number per bin, the black dots the mean values per bin.

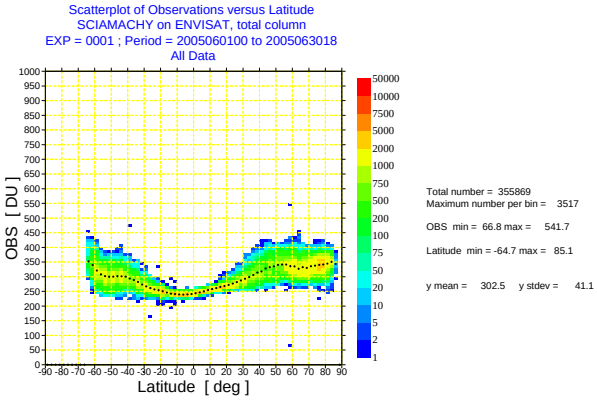

Fig. 14. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for June 2005. The colours show the number per bin, the black dots the mean values per bin.

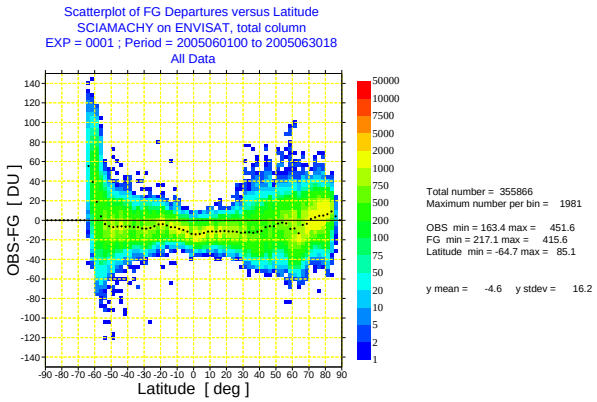

Fig. 15. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for June 2005. The colours show the number per bin, the black dots the mean values per bin.