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

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1. Key points for September 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 in the global mean
- Relatively large biases south of 50S along 90W, 0 (and 90E) meridians
- 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 September 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 its standard deviations, and mean first-guess departures as well as its standard deviations are shown in Figures 7-11. Timeseries of zonal mean number of data, zonal mean observation values and its standard deviations and zonal mean first-guess departures as well as its standard deviations are shown in Figures 12-16. Figures 17-19 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 September. The values of the global mean first-guess departures are about -5 DU whereas the global mean analysis departures are about -1.5 DU (analysis is drawing to the KNMI SCIAMACHY data as these data are actively assimilated in the ECMWF assimilation system). In the gobal mean, SCIAMACHY ozone values have decreased from 282 DU in August to 268 DU this month due to the low ozones values (ozone hole) at the South Pole (Figs. 1 and 6).

The standard deviations of the mean departures and of SCIAMACHY data are also stable in September. The increase of the SCIAMACHY data standard deviations already noticeable last month is still observed this month. In the global mean, those values have increased from about 33 DU in August to 49 DU in September and this increase is due to larger SCIAMACHY data standard deviations at the high latitudes (Figs 1 and 6, third pannel from the top).

There are no data on 07 September (06 and 12 UTC due to an out-of-plane ENVISAT orbitral control manoeuvre) and on 21 (00 UTC, no data available on the ESA ftp server) and 22 September (00 and 06 UTC, data from ESA ftp server available too late for the operational ECMWF analysis).

The geo plots (Figures 7-11) show again that the largest model biases and the largest standard deviations of SCIAMACHY data (and of the departures as well) are located at the southern high latitudes. The geographical distribution of mean first-guess departures (Fig. 10) display relatively large biases south of 50S along 90W, 0 (and 90E) meridians. The geographical distribution of the mean observation values (Fig. 7) show that in those locations the mean ozone values are larger than the neighbouring mean values.

From the Hovmoeller and from the scatter plots, Figures 12-16 and Figures 17-19 respectively, one can see again the largest departures at the southern high latitudes. The scatter plot of the first-guess departures against latitude shows a large scatter of (mainly) positive biases in the latitude band 50S - 80S.

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).

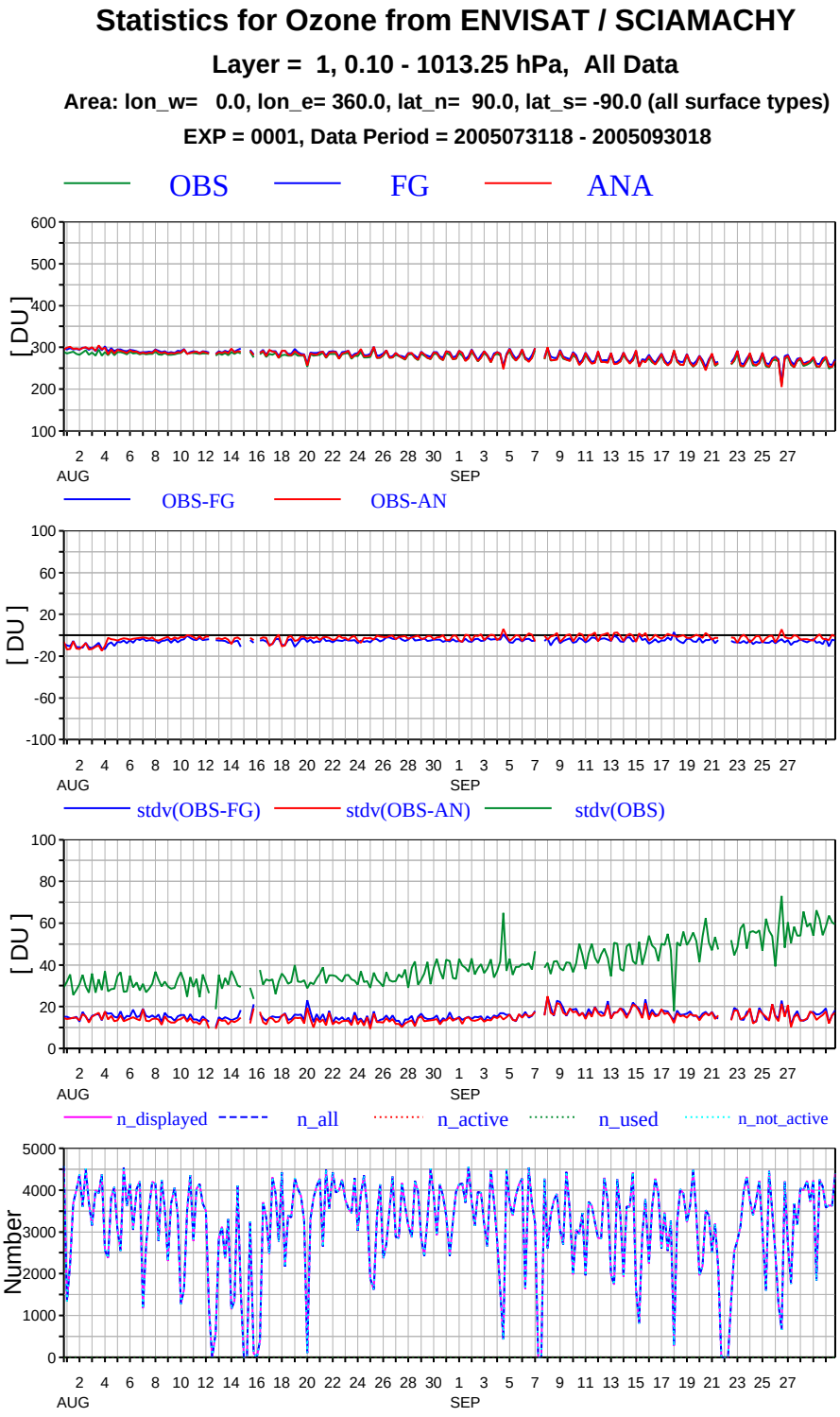

Fig. 1. Time series of mean observations, first guess and analysis values (top panel), first-guess and analysis departures (second panel), standard deviations (third panel) and number of data (bottom panel) per 6-hour cycle for ENVISAT SCIAMACHY NRT ozone data for August and September 2005 (Global means).

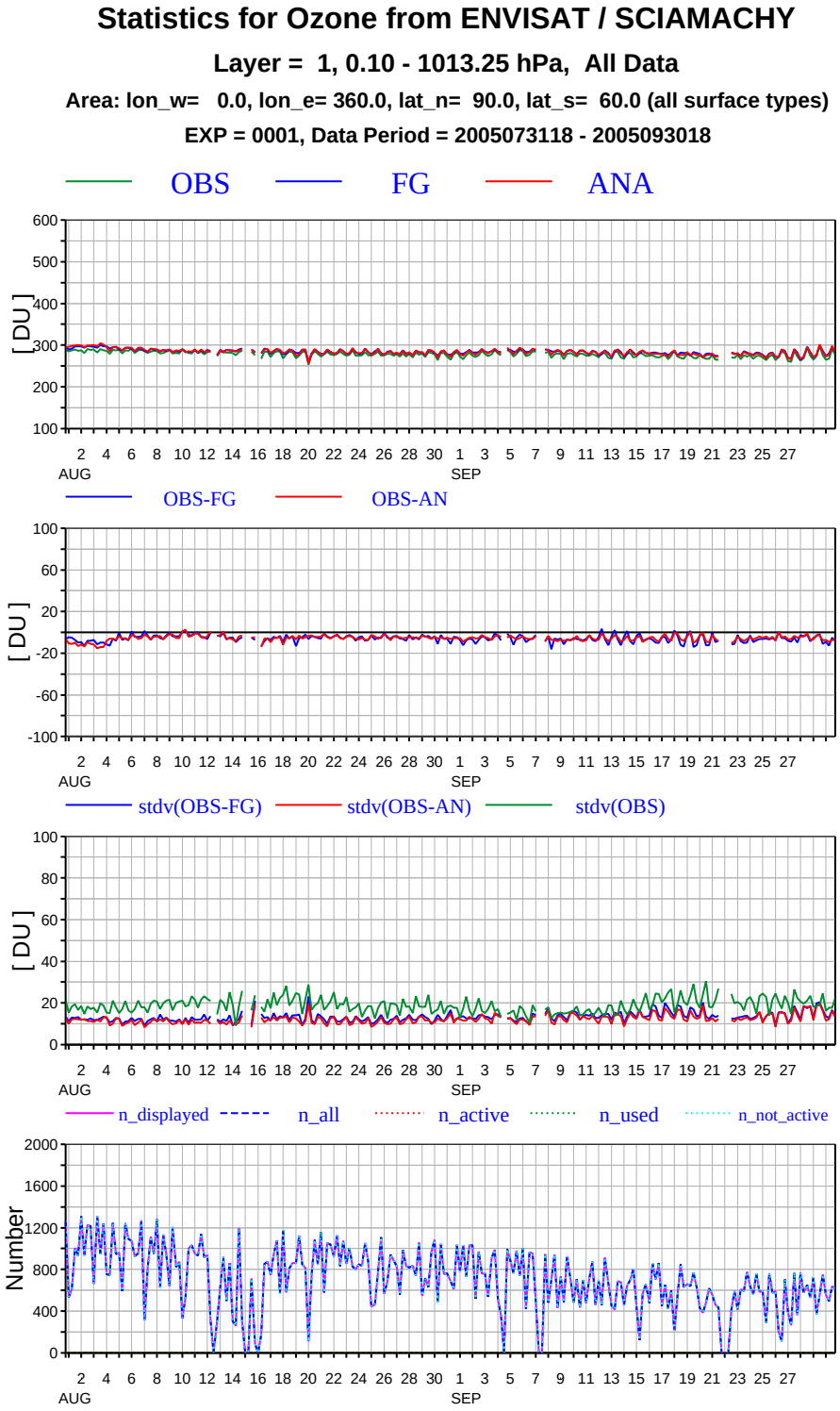

Fig. 2. As Fig.1 but for 90-60N.

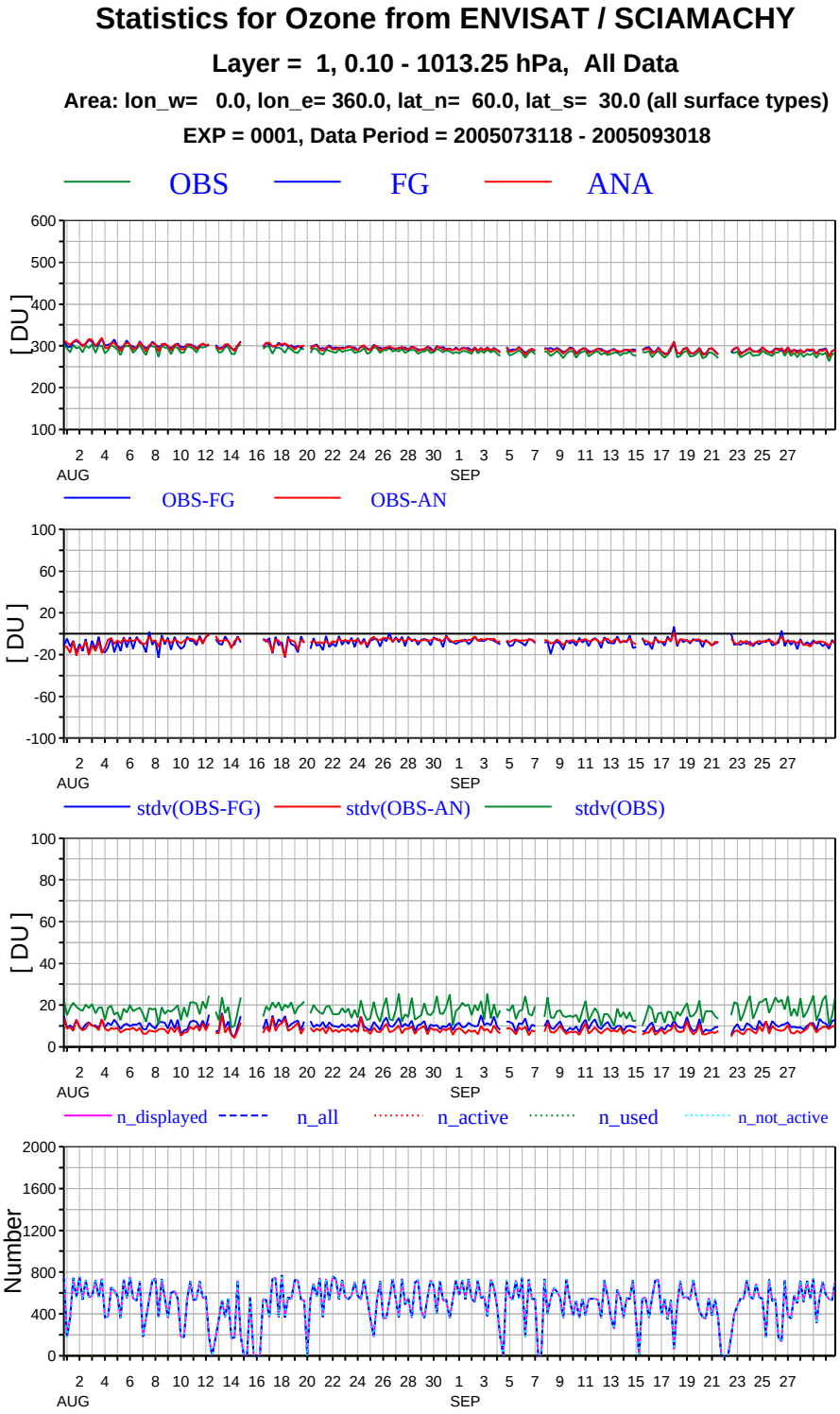

Fig. 3. As Fig. 1 but for 60-30N.

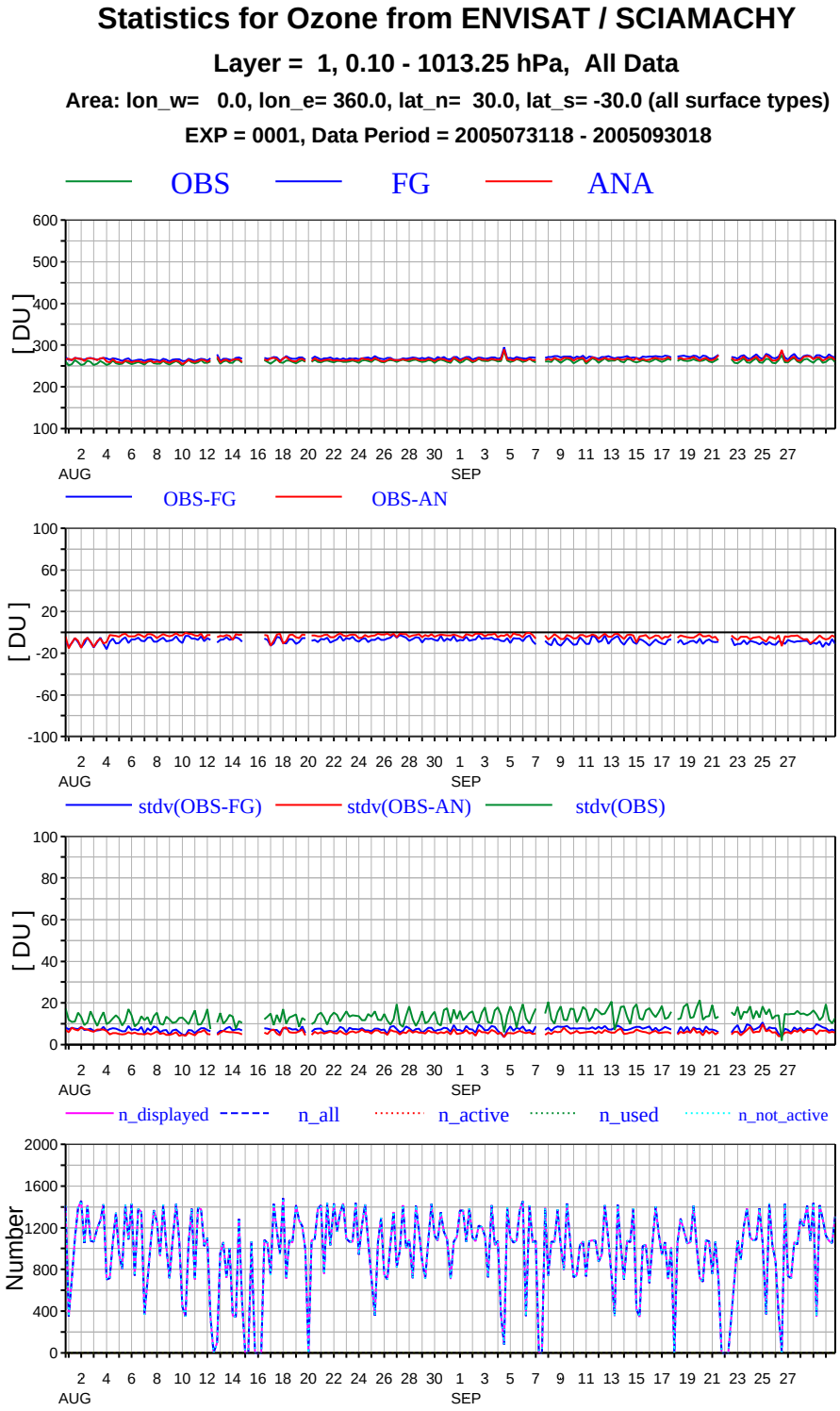

Fig. 4. As Fig. 1 but for 30N-30S.

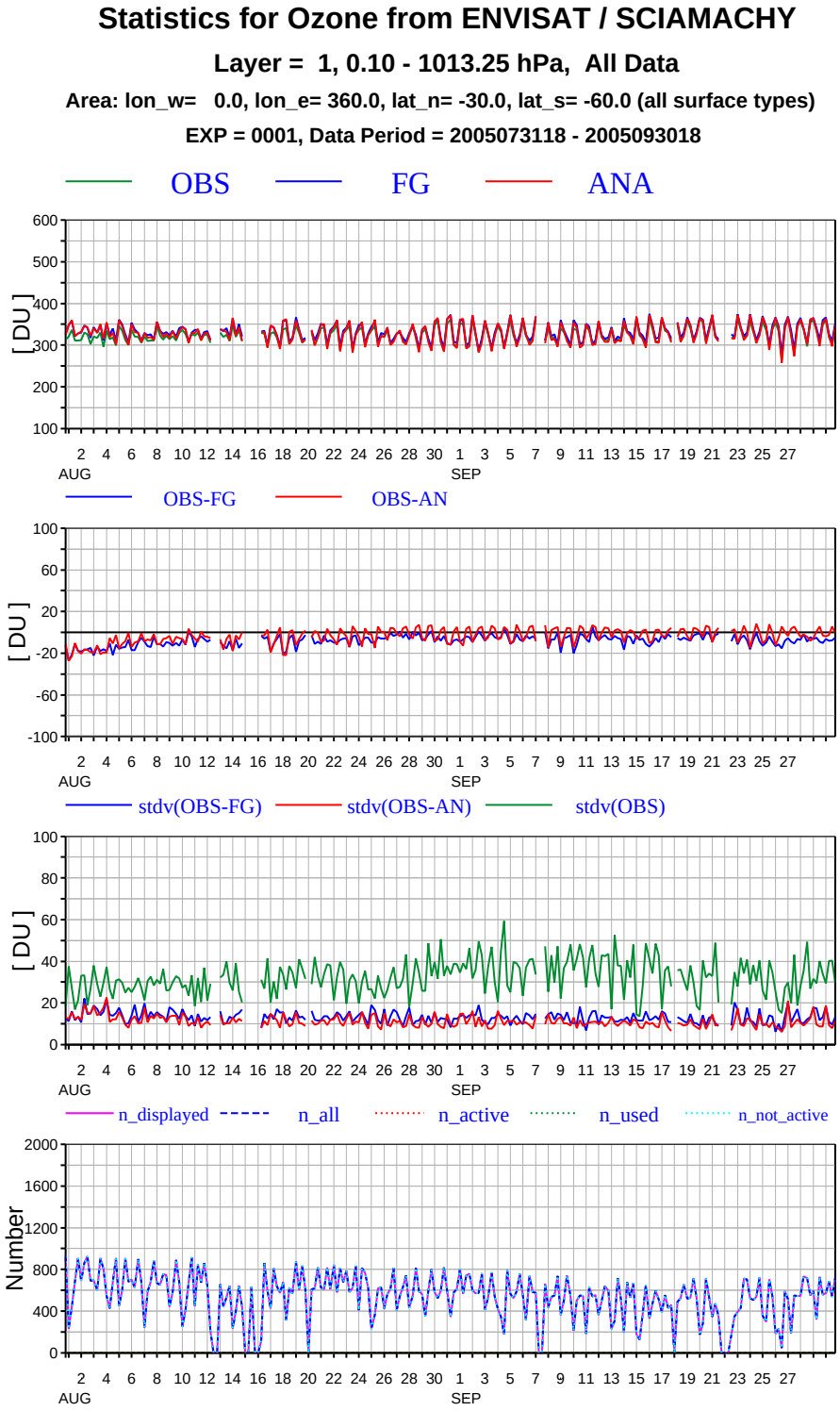

Fig. 5. As Fig. 1 but for 30-60S.

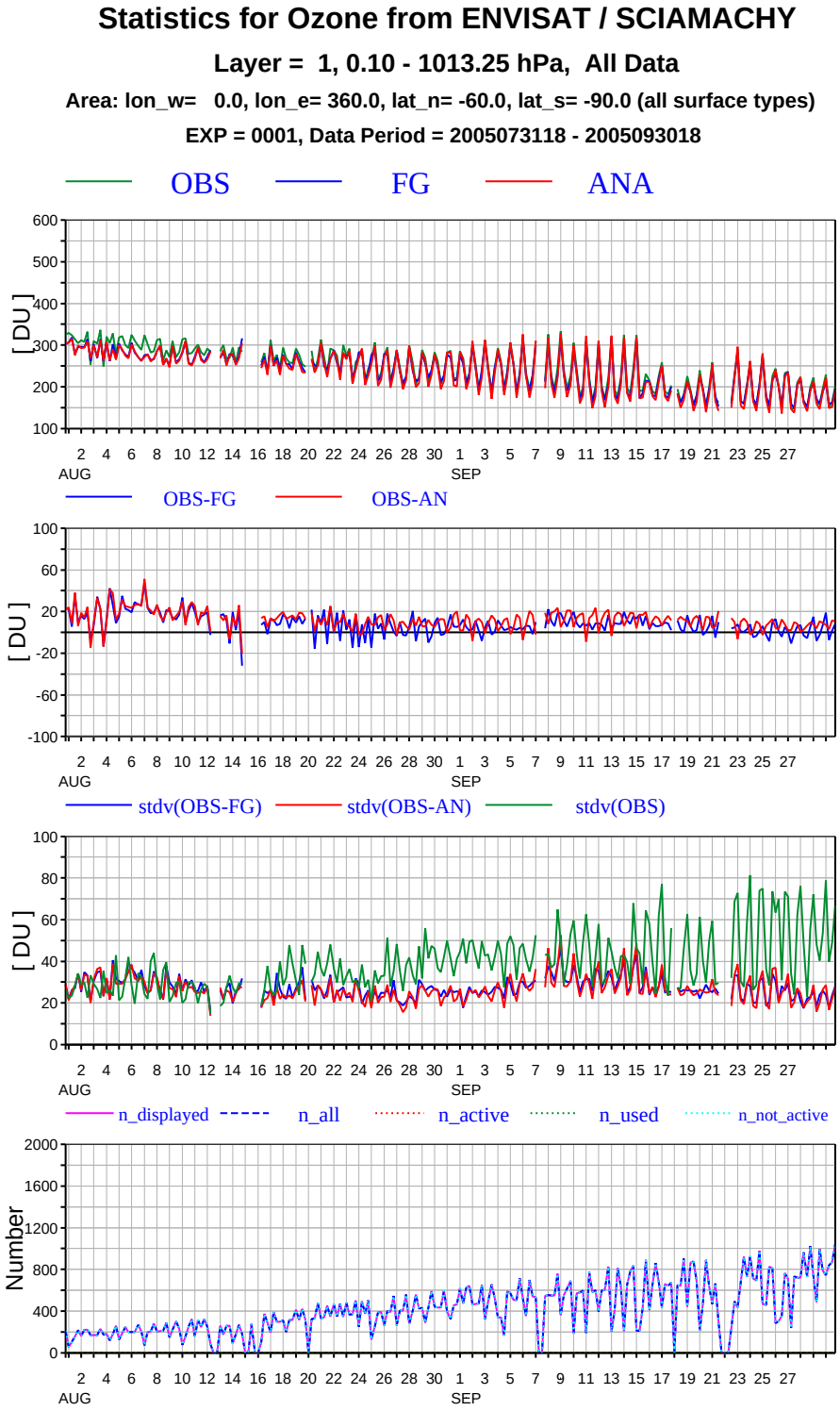

Fig. 6. As Fig. 1 but for 60-90S.

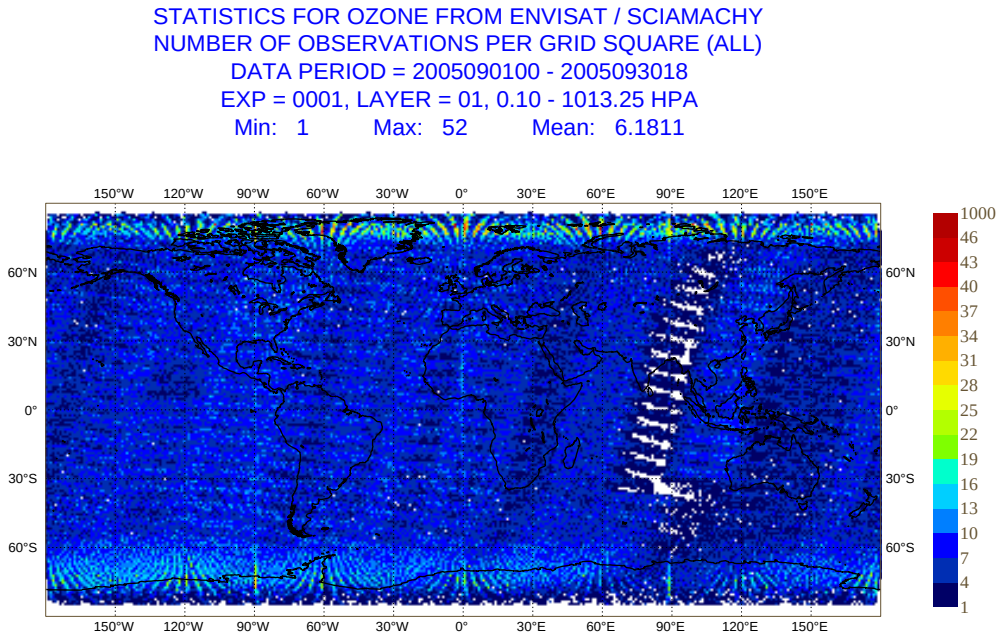

Fig. 7. Geographical distribution of mean number of data for ENVISAT SCIAMACHY NRT ozone data for September 2005.

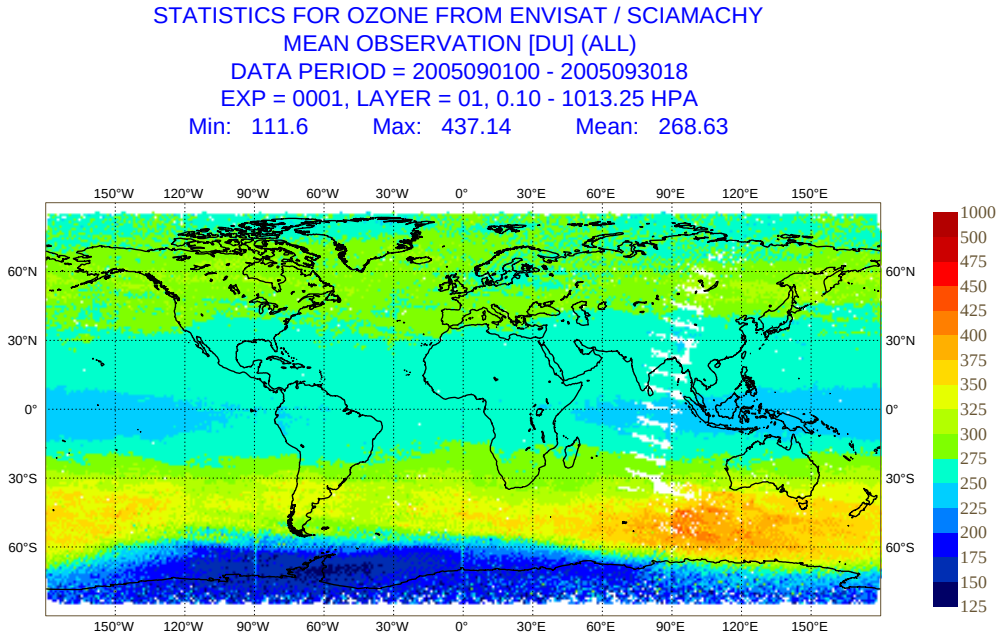

Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for September 2005.

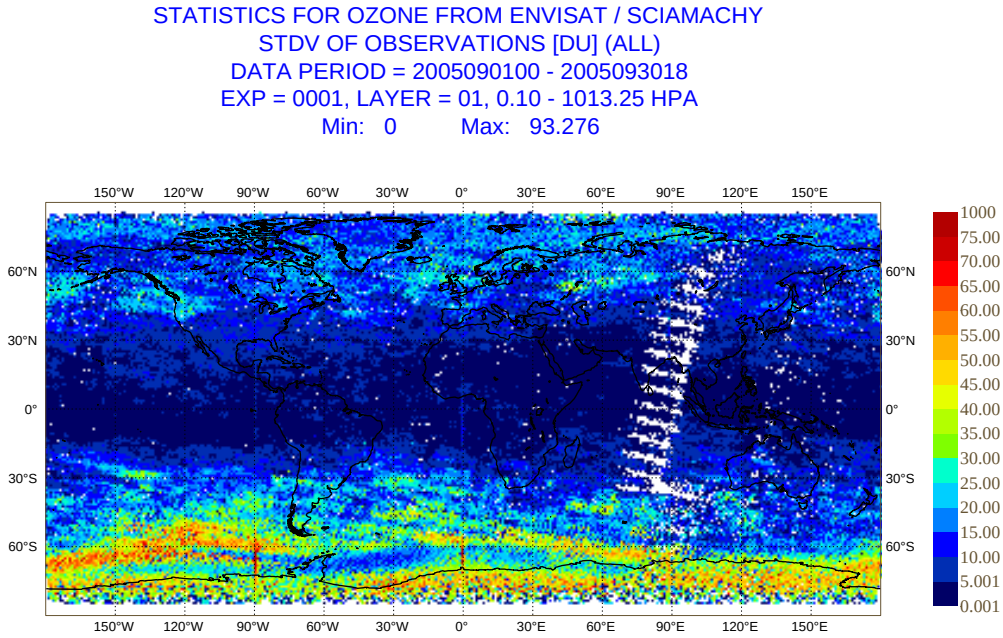

Fig. 9. Geographical distribution of the standard deviation of the mean observation values for ENVISAT SCIAMACHY NRT ozone data for September 2005.

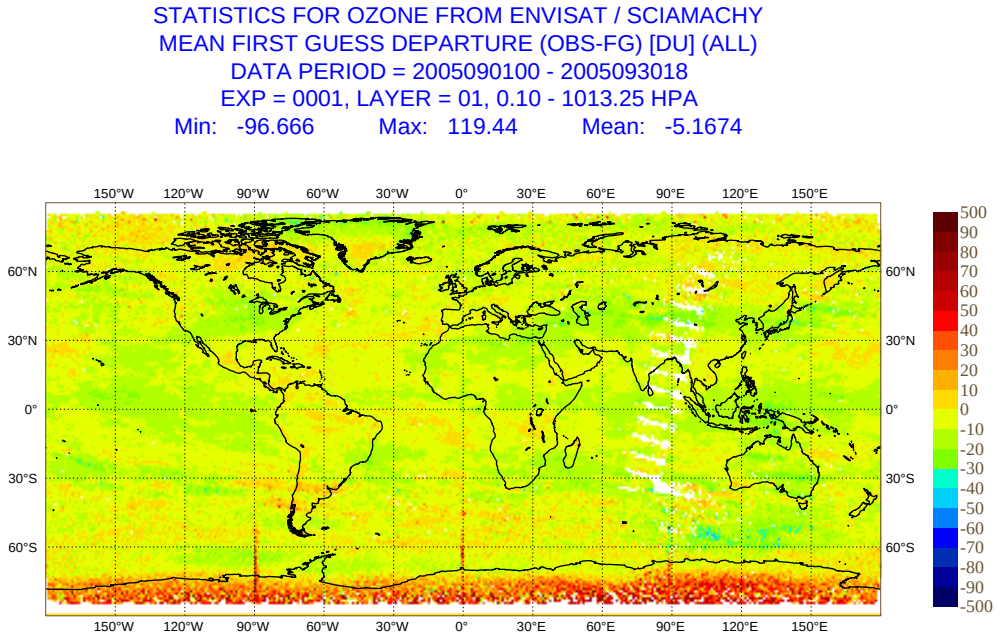

Fig. 10. Geographical distribution of mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for September 2005.

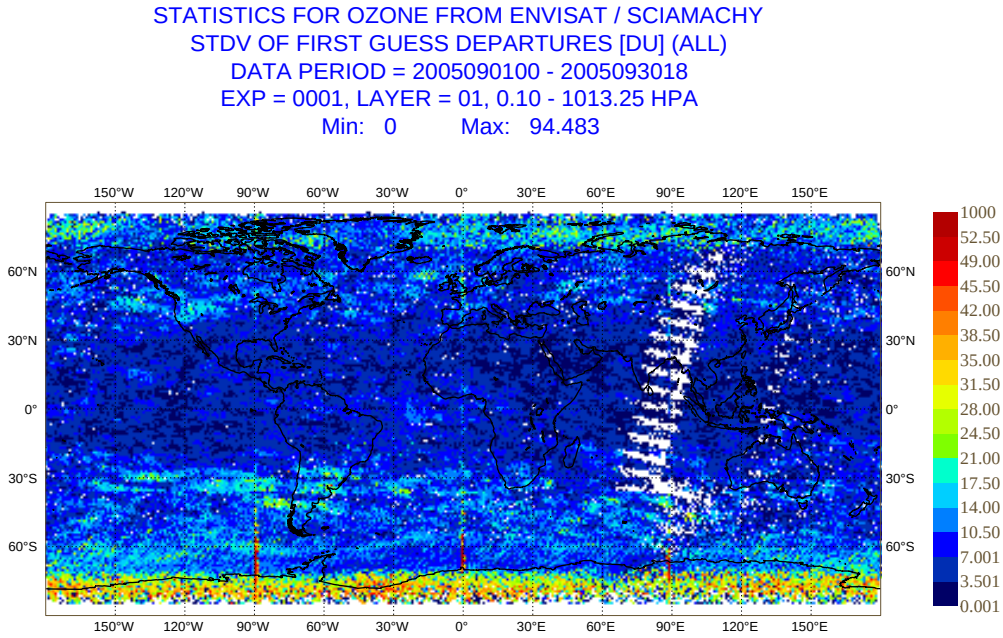

Fig. 11. Geographical distribution of the standard deviation of the mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for September 2005.

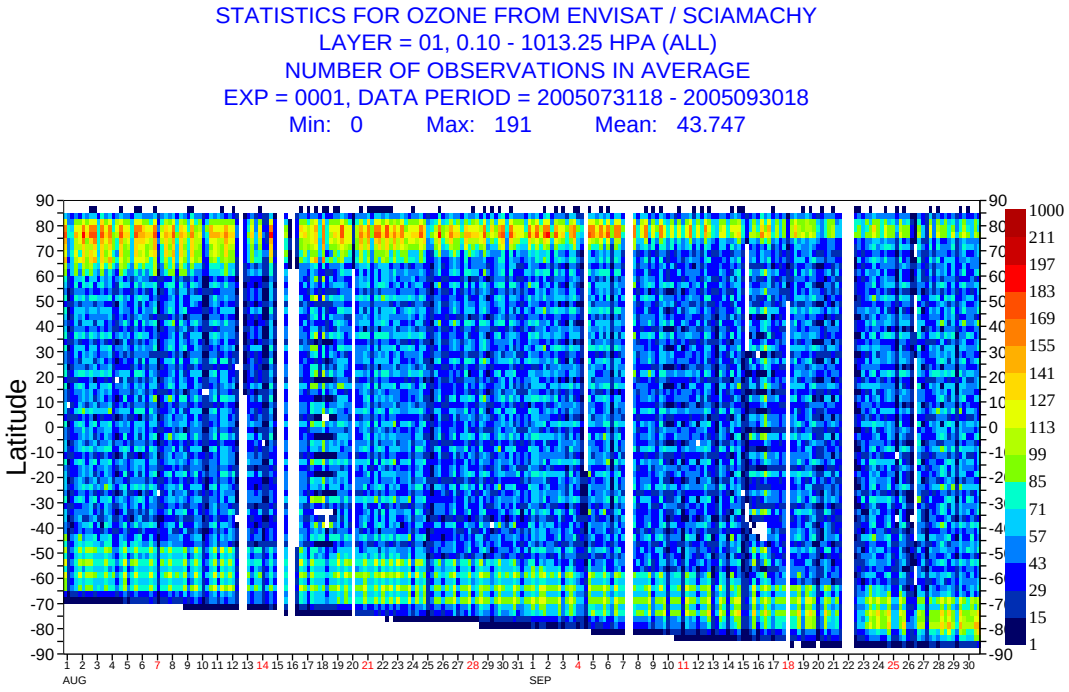

Fig. 12. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for August and September 2005.

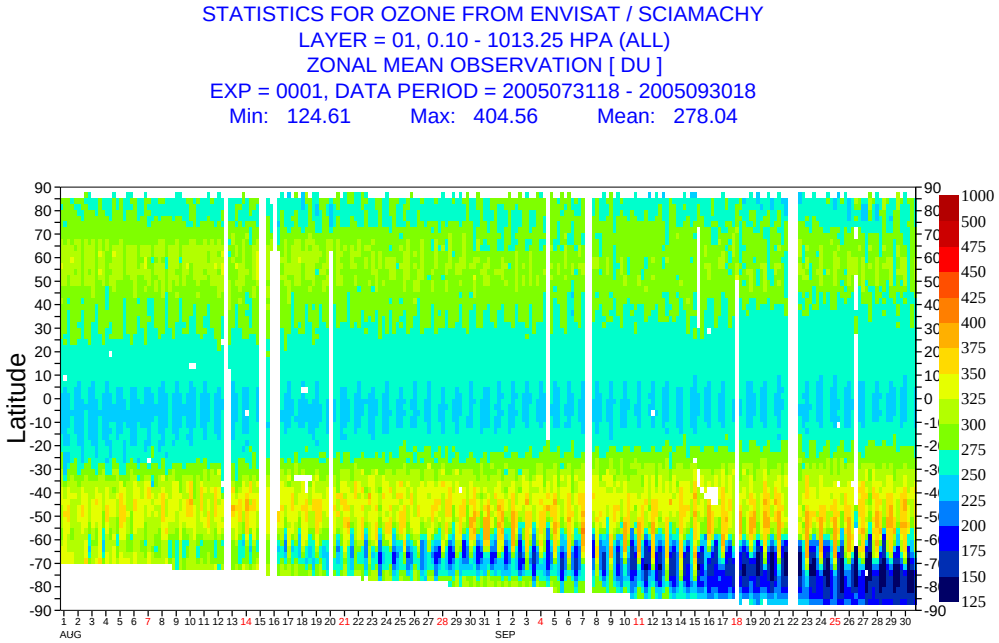

Fig. 13. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for August and September 2005.

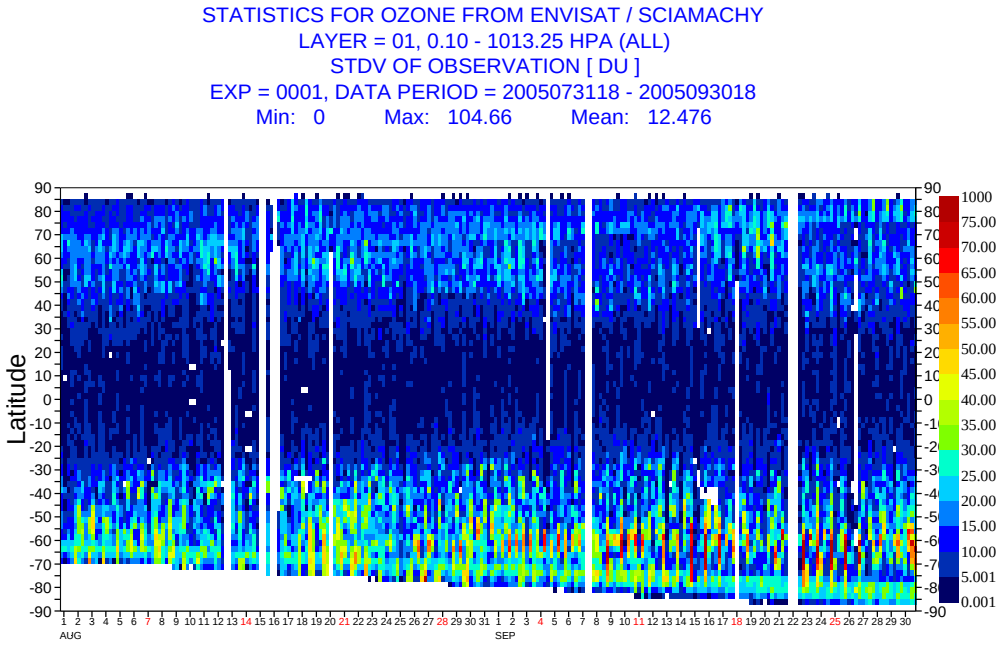

Fig. 14. Hovmoeller diagram of the zonal mean observation standard deviations for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for August and September 2005.

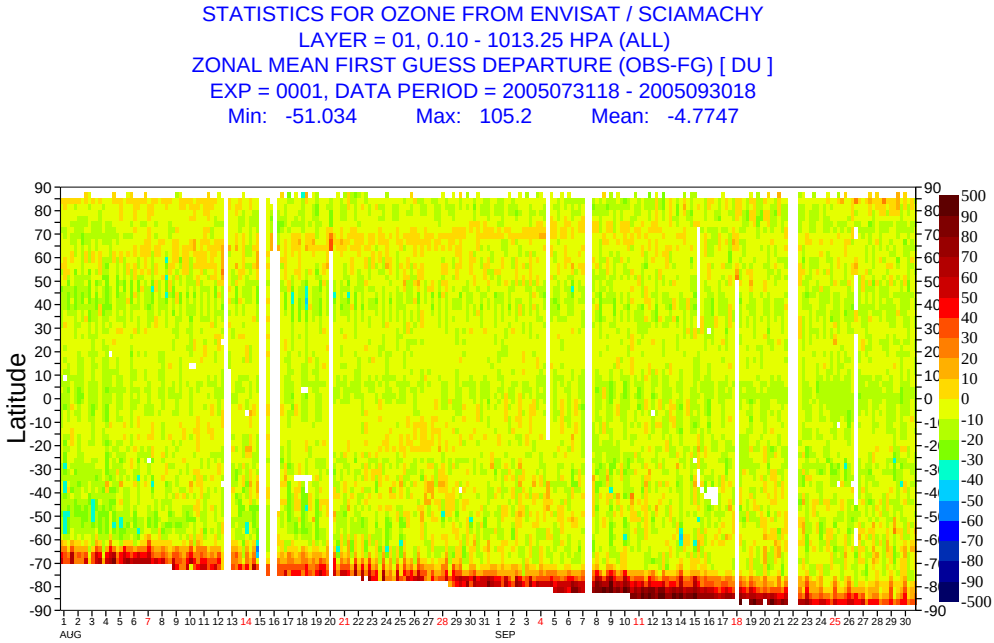

Fig. 15. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for August and September 2005.

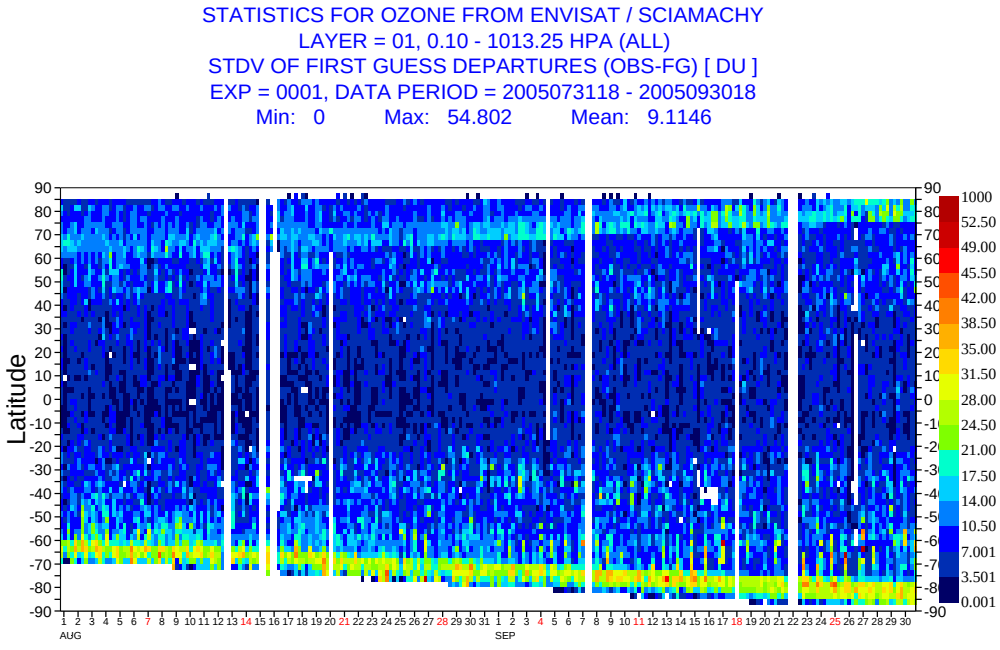

Fig. 16. Hovmoeller diagram of zonal mean first-guess departures standard deviations for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for August and September 2005.

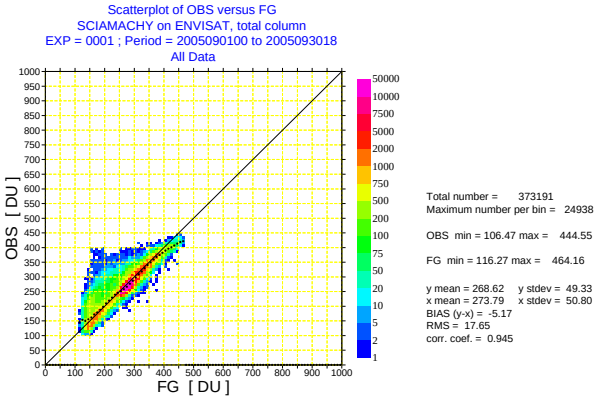

Fig. 17. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for September 2005. The colours show the number per bin, the black dots the mean values per bin.

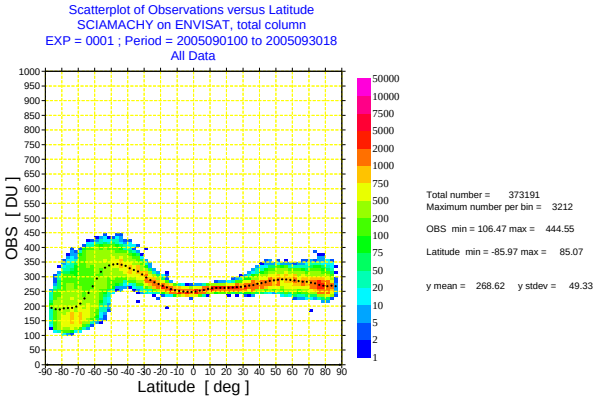

Fig. 18. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for September 2005. The colours show the number per bin, the black dots the mean values per bin.

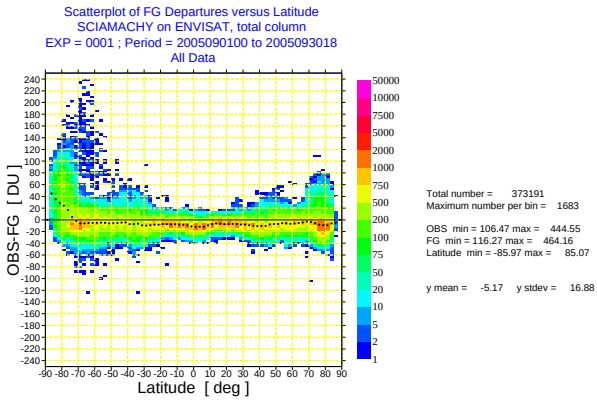

Fig. 19. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for September 2005. The colours show the number per bin, the black dots the mean values per bin.