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

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1. Key points for November 2005

- SCIAMACHY data quality stable
- SCIAMACHY large drift as compared to ECMWF model in the northern extratropics throughout the month
- Large SCIAMACHY data and analysis and first-guess departures standard deviations, in particular at high latitudes
- Unrealistically large ozone values in the latitude band 70°S-82.5°S
- Relatively large biases south of 50°S along about 0° and 90°E 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 November 2005. Amount of received data and their quality are shown in Figures 1-6 for various latitude bands. Geographical distributions and zonal means timeseries of number of data, observation values, first-guess departures, and of observations and first-guess departures standard deviations are presented in Figures 7-11 and Figures 12-16, respectively. 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 show that SCIAMACHY data quality is stable in November. A drift in the mean departures from positive to negative values can be clearly seen throughout the month in the northern extratropics, in particular at high latitudes. In the global mean, analysis and first-guess departures are around 6 DU and 3 DU, respectively. However, mean departures over -100 DU can be observed at the northern high latitudes while at the southern high latitudes mean departures can attain +100 DU.

The standard deviations of the mean analysis and first-guess departures, and of SCIAMACHY data are still large this month, in particular at high latitudes (e.g. at southern high latitudes those values are over 100 DU).

The poor data quality that has been seen since 15 October is due to a wrong handling of the season index 3 of the operational processor IPF version 5.04 (visit http://envisat.esa.int/dataproducts/availability/disclaimers for further information).

The geo plots also illustrate that the largest model biases and the largest standard deviations of SCIAMACHY data and of the departures, are located at the high latitudes in both hemispheres (Figures 10 and 11). For instance, while the largest positive departures are seen at the southern high latitudes (values up to 524 DU in an averaged grid of 1° x 1°), the largest negative biases are found at the northern high latitudes (values up to -275 DU). The relatively large biases south of 50°S along about 0° and 90°E meridians, which have been reported since last September, are still seen this month.

The Hovmoeller plot of Figure 15 further illustrate the drift in the mean departures in the northern extratropics mentioned above.

Unrealistically large ozone values (up to 934 DU) in the latitude belt 70°S-82.5°S are shown in the scatter plot of SCIAMACHY ozone values against latitude (Figure 18). The large positive and negative departures at the southern and at the northern high latitudes, respectively, can also be seen in the scatter plot of Figure 19.

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).

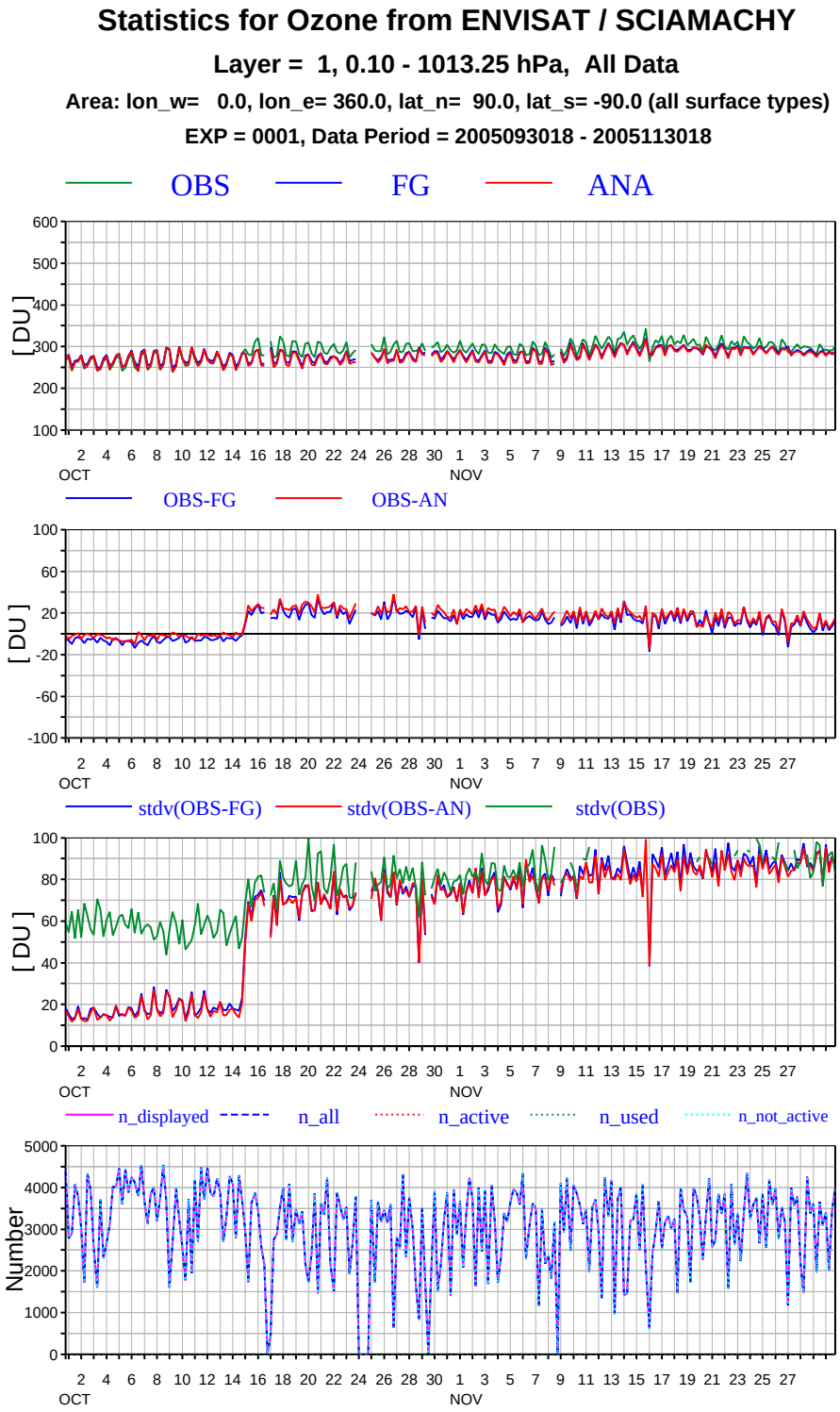

Fig. 1. Time series of mean observations, first guess and analysis values (top panel), first-guess and analysis departures (second panel), standard deviations (third panel) and number of data (bottom panel) per 6-hour cycle for ENVISAT SCIAMACHY NRT ozone data for October and November 2005 (Global means).

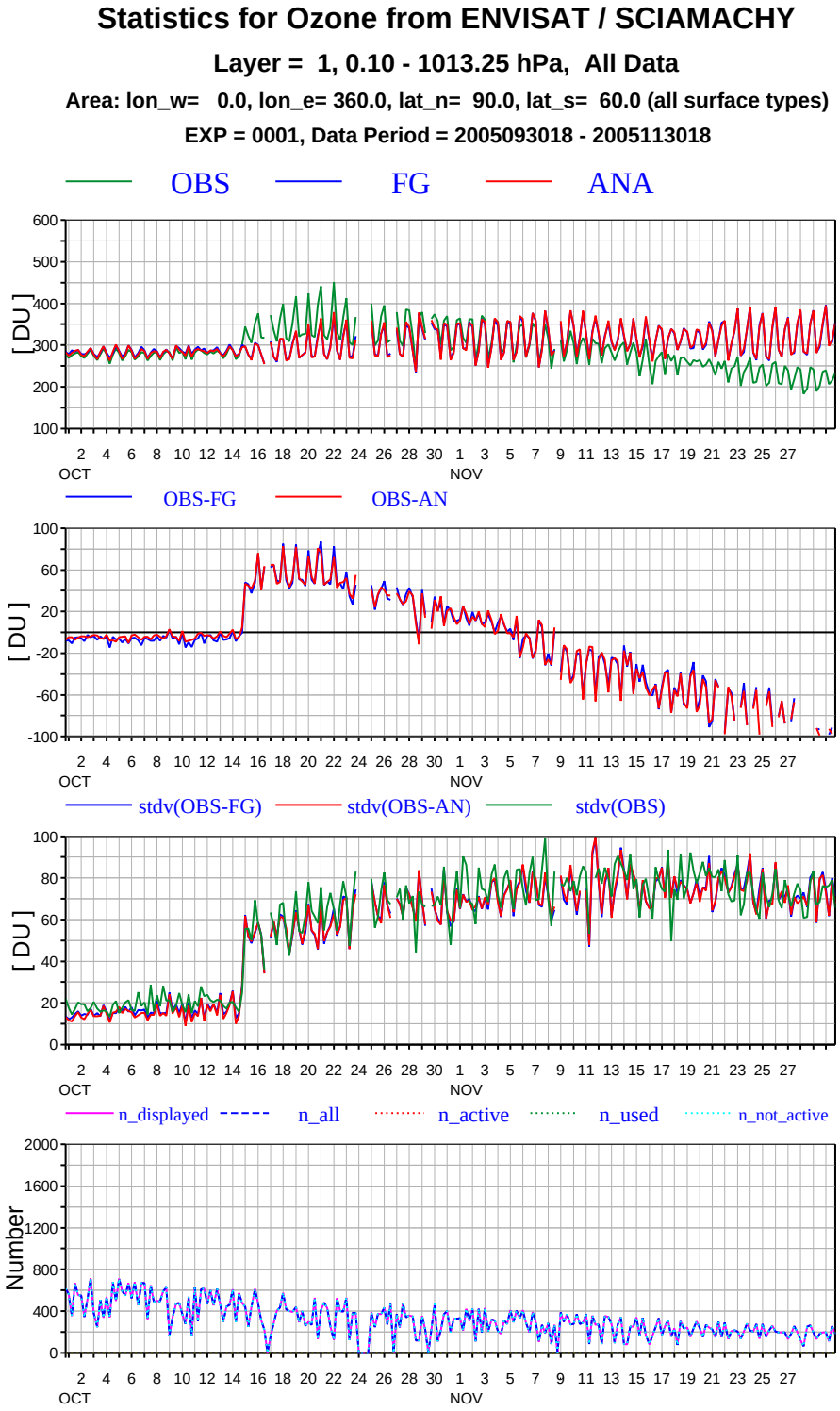

Fig. 2. As Fig.1 but for 90-60N.

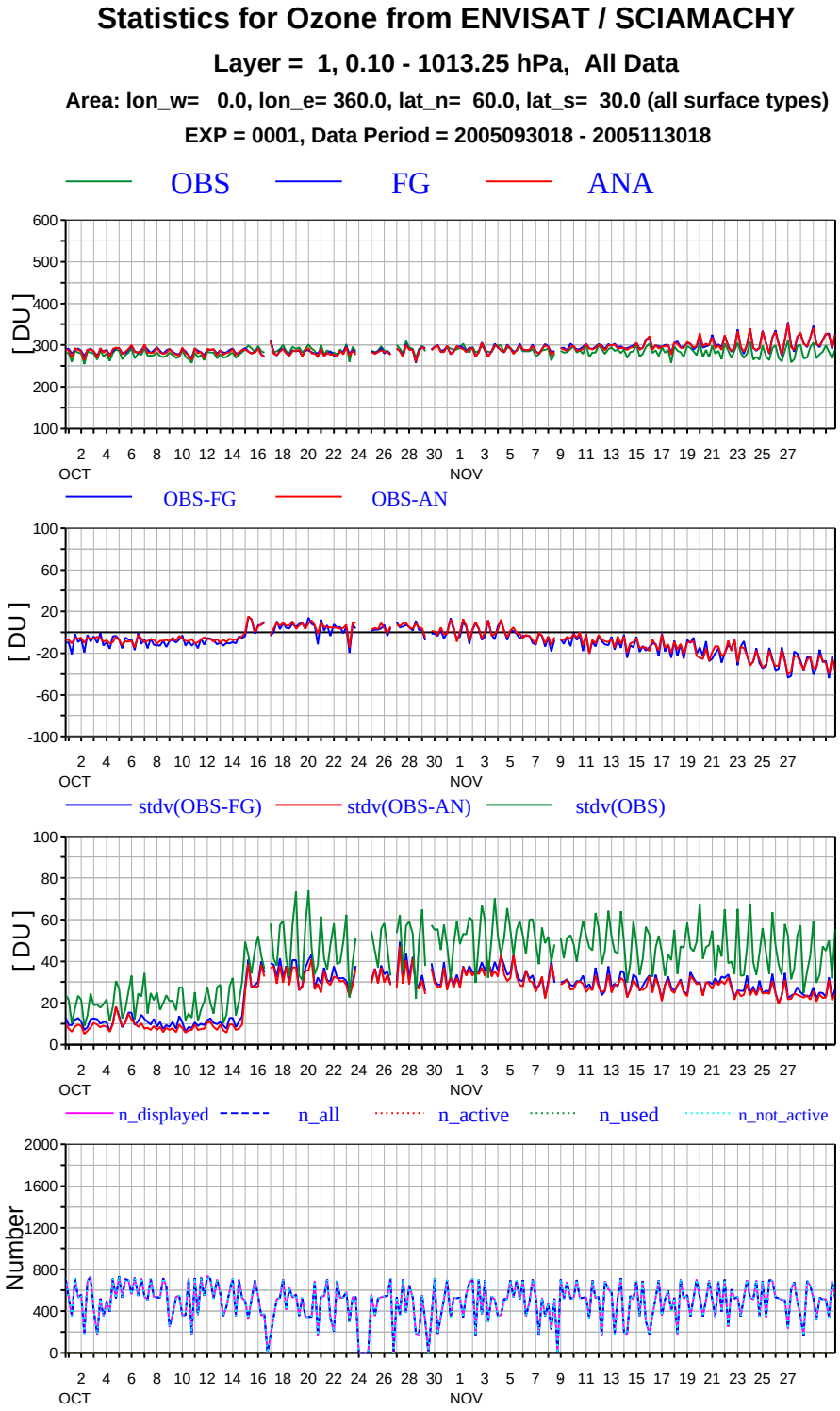

Fig. 3. As Fig. 1 but for 60-30N.

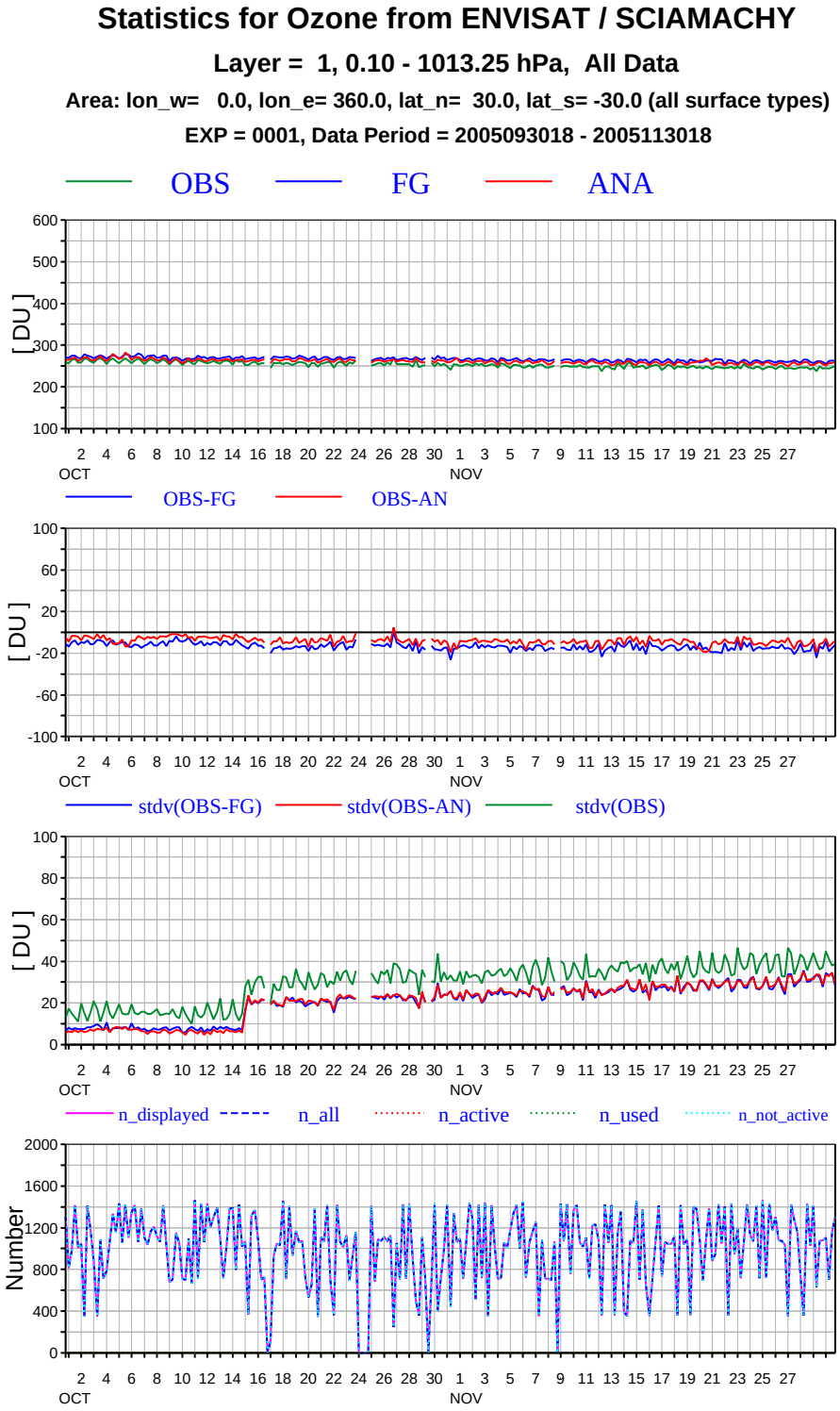

Fig. 4. As Fig. 1 but for 30N-30S.

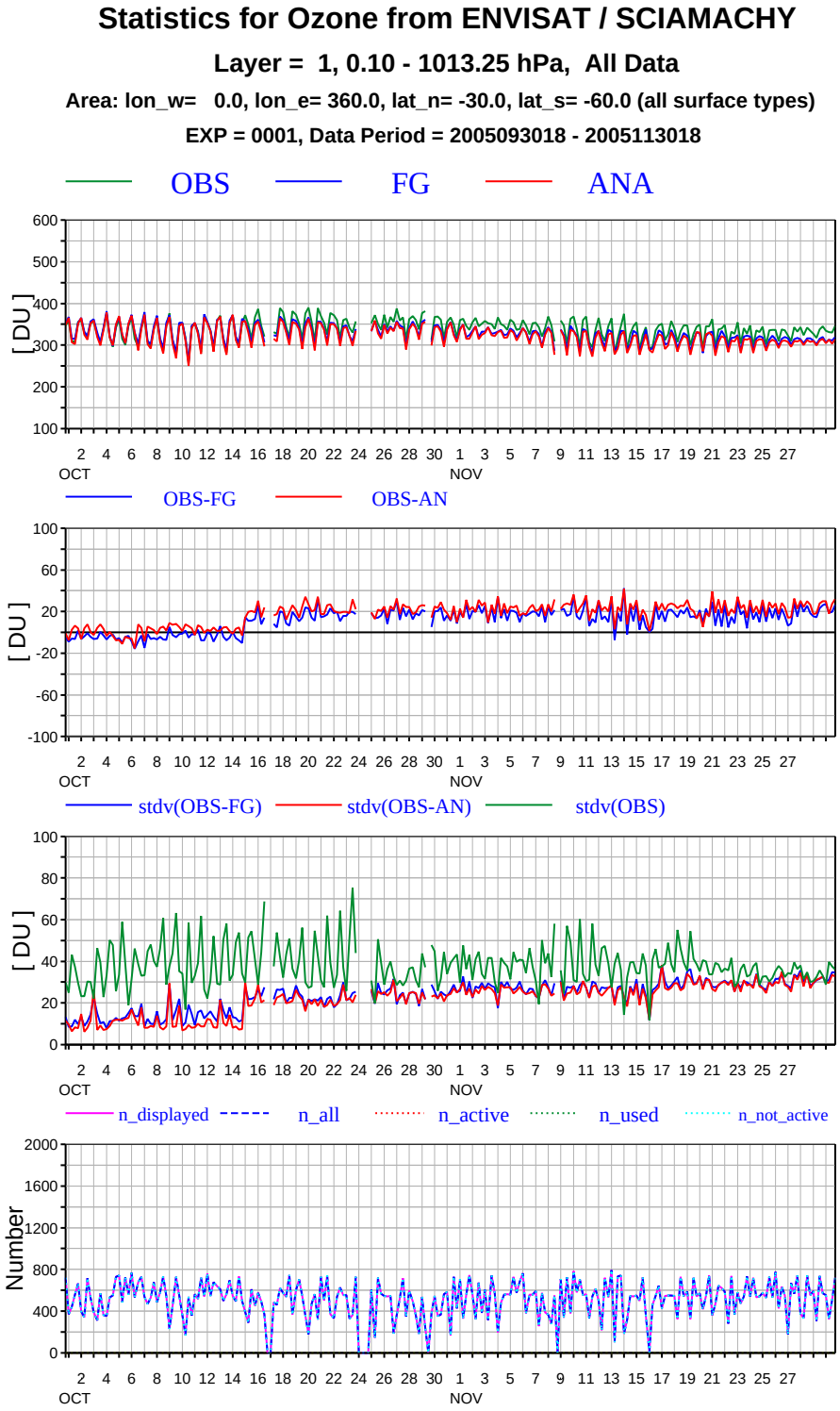

Fig. 5. As Fig. 1 but for 30-60S.

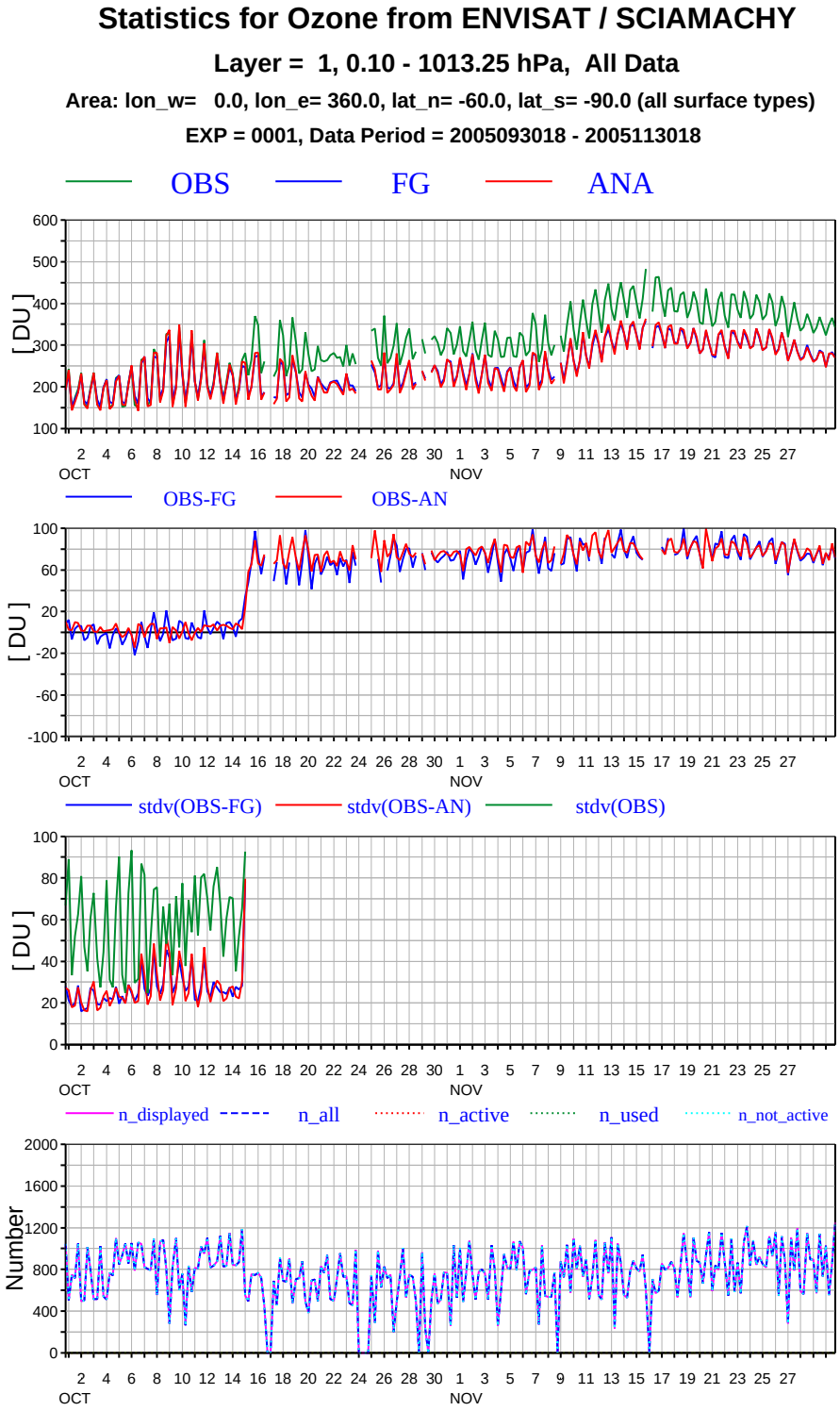

Fig. 6. As Fig. 1 but for 60-90S.

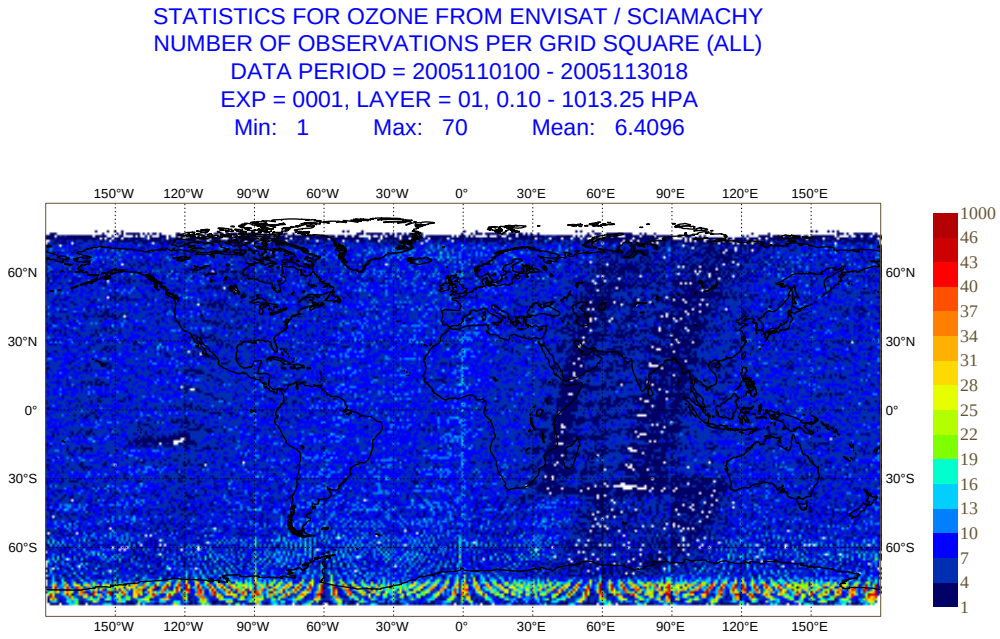

Fig. 7. Geographical distribution of mean number of data for ENVISAT SCIAMACHY NRT ozone data for November 2005.

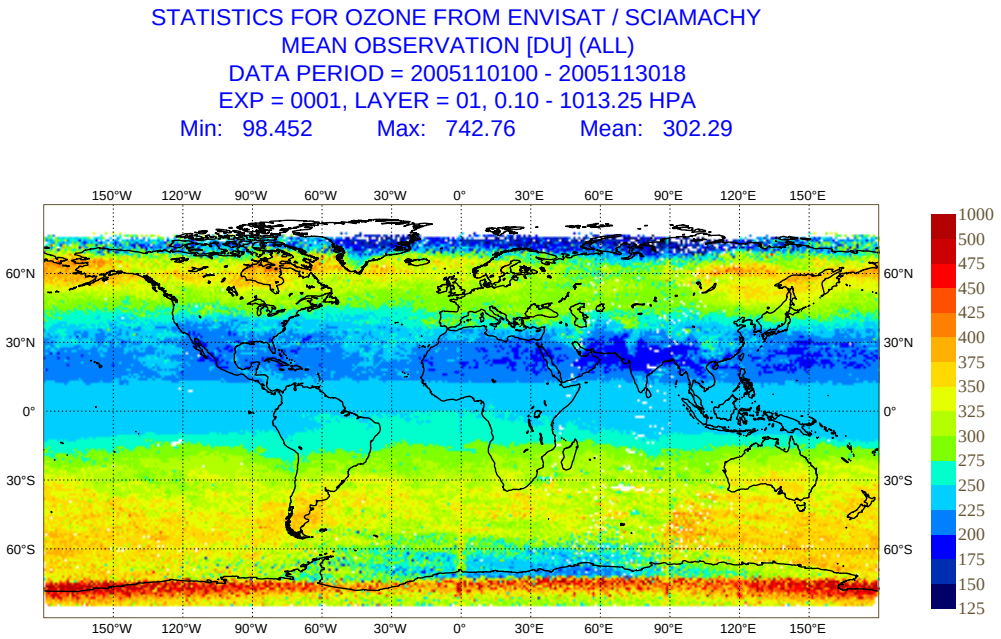

Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for November 2005.

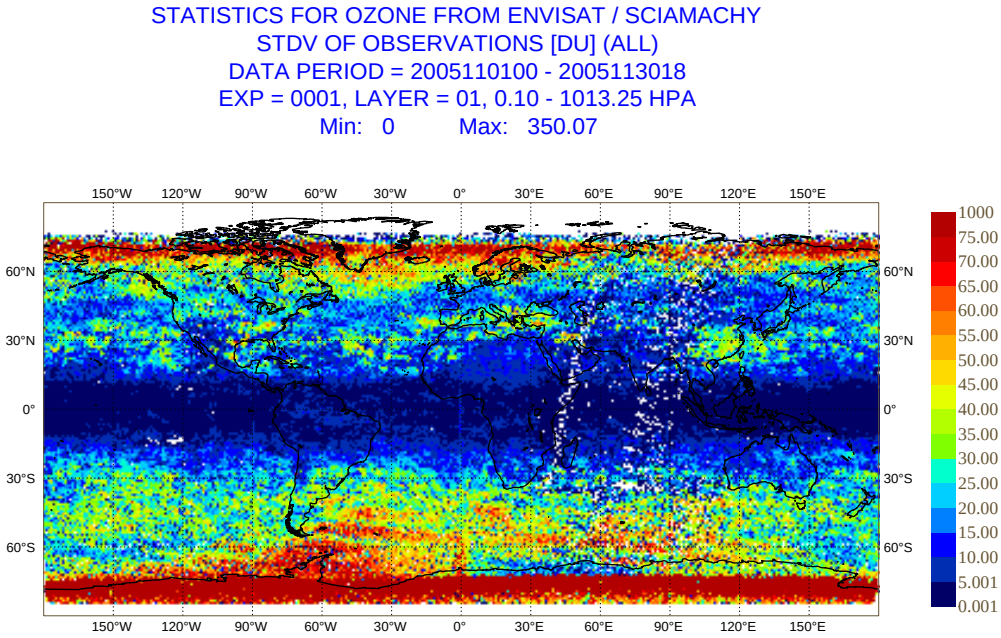

Fig. 9. Geographical distribution of the standard deviation of the mean observation values for ENVISAT SCIAMACHY NRT ozone data for November 2005.

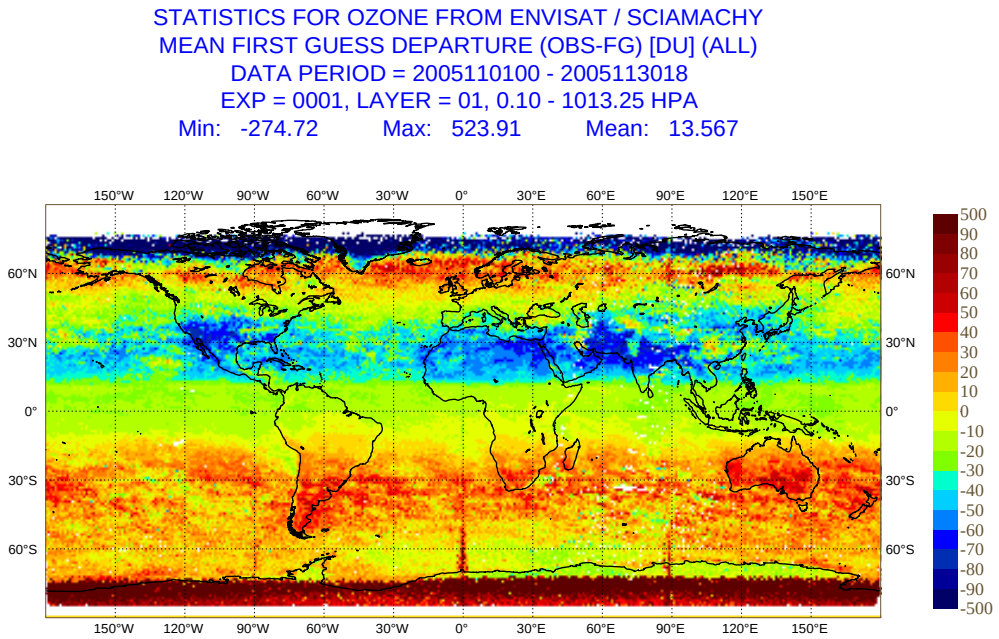

Fig. 10. Geographical distribution of mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for November 2005.

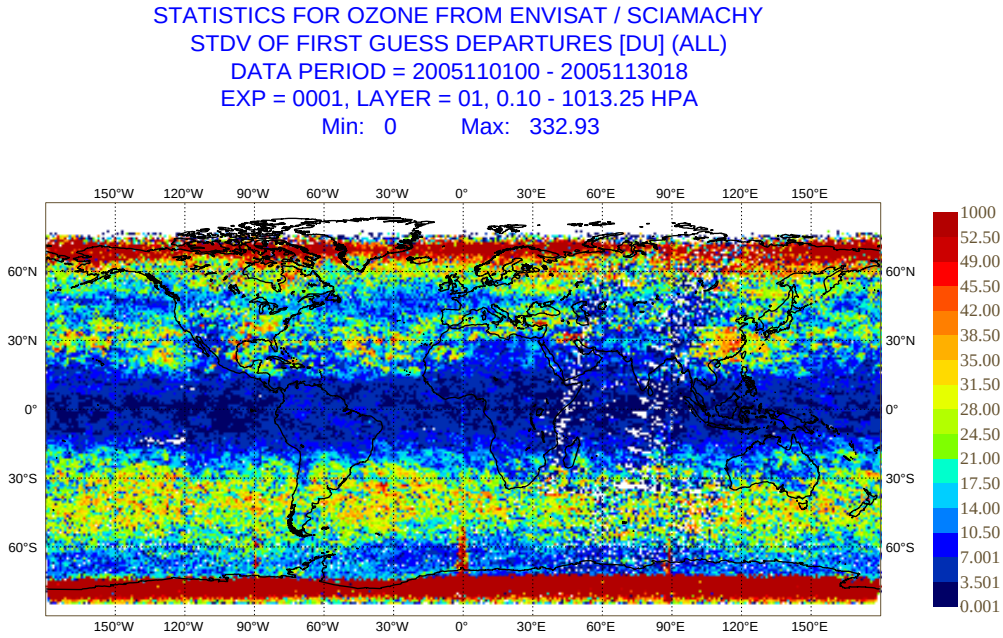

Fig. 11. Geographical distribution of the standard deviation of the mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for November 2005.

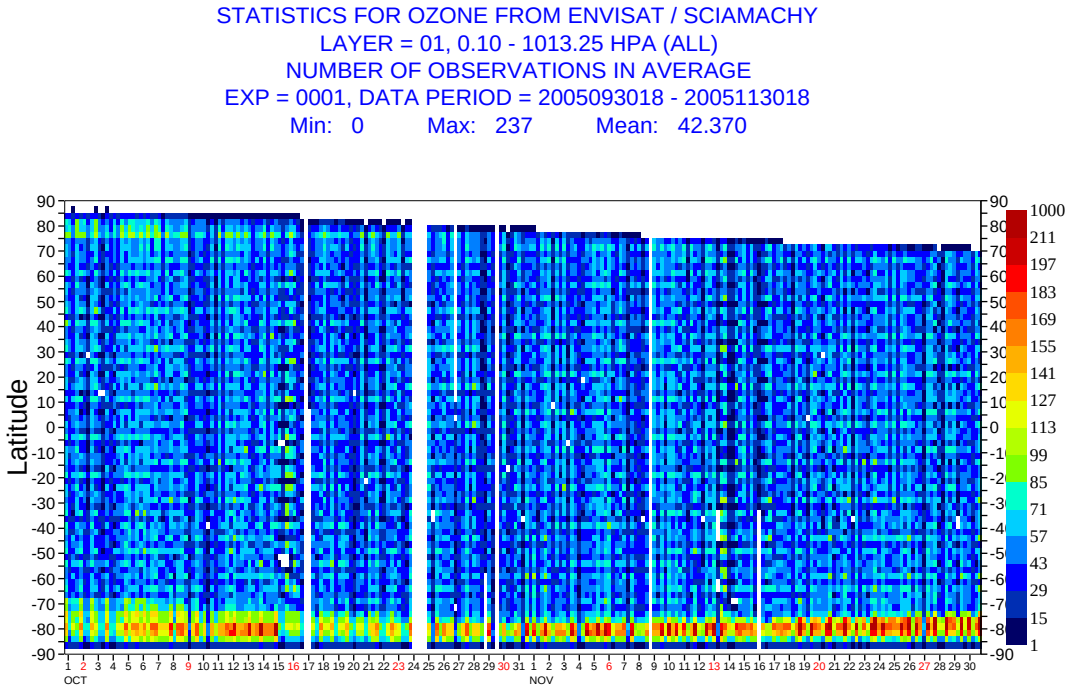

Fig. 12. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for October and November 2005.

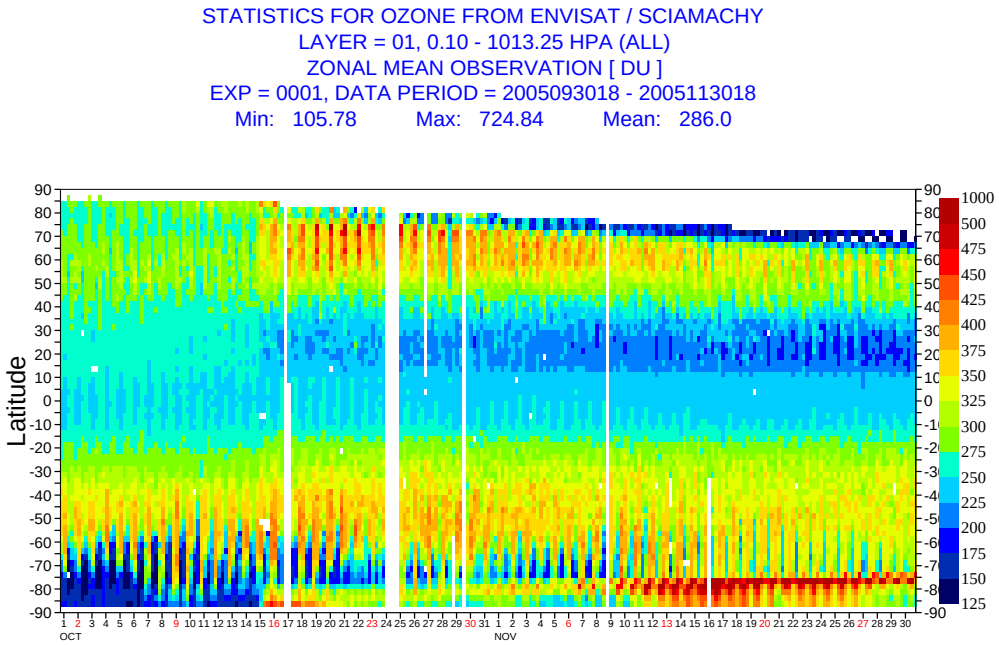

Fig. 13. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for October and November 2005.

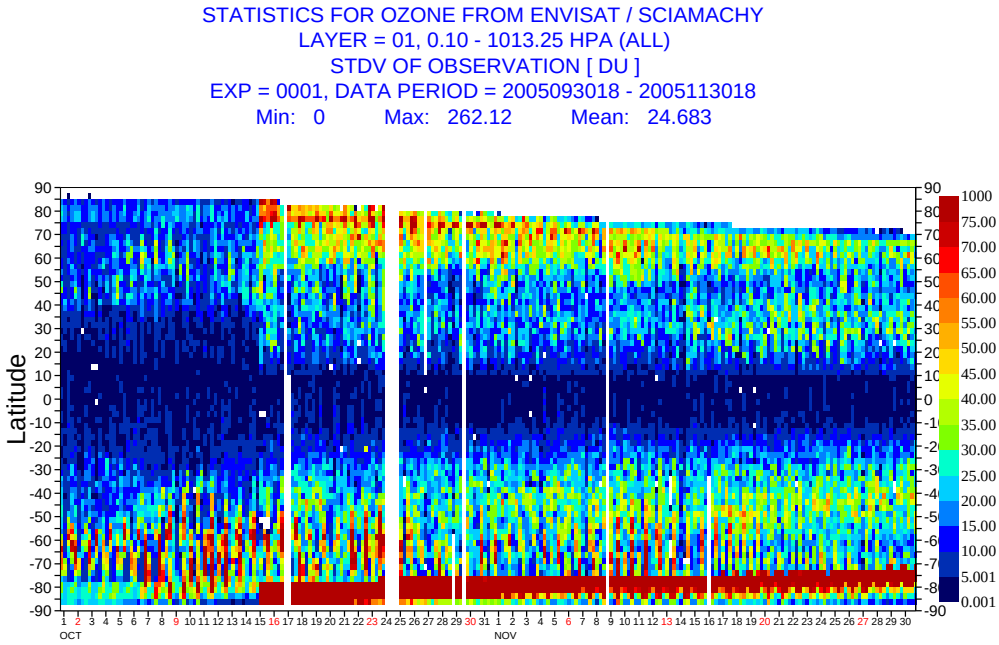

Fig. 14. Hovmoeller diagram of the zonal mean observation standard deviations for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for October and November 2005.

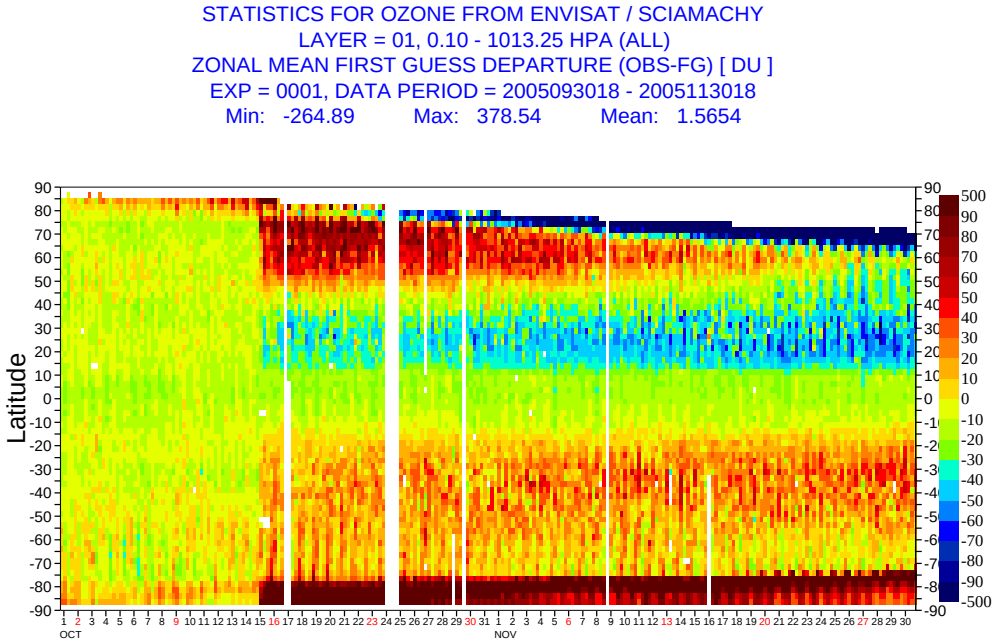

Fig. 15. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for October and November 2005.

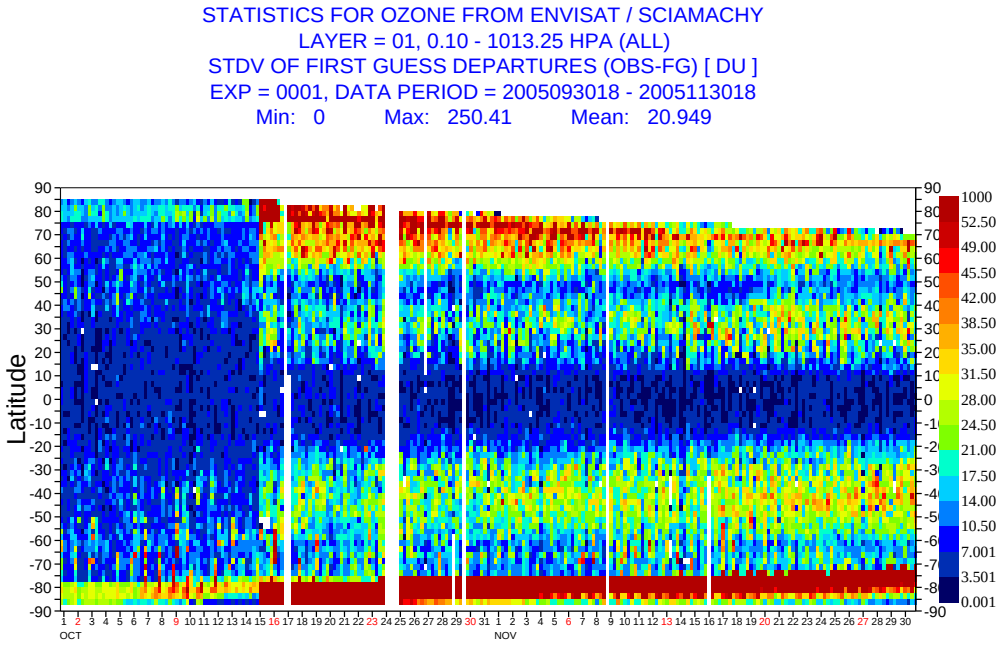

Fig. 16. Hovmoeller diagram of zonal mean first-guess departures standard deviations for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for October and November 2005.

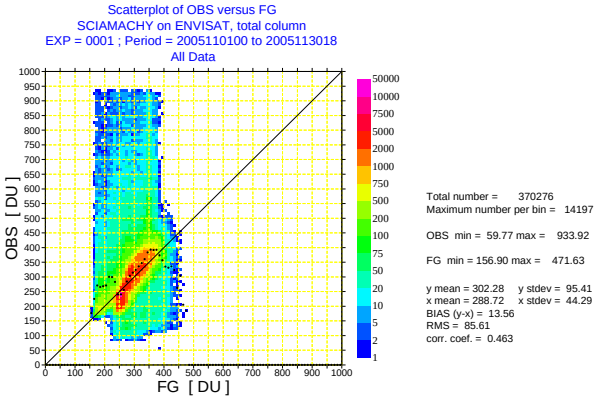

Fig. 17. Scatter plot of ENVISAT SCIAMACHY ozone values against first-guess for November 2005. The colours show the number per bin, the black dots the mean values per bin.

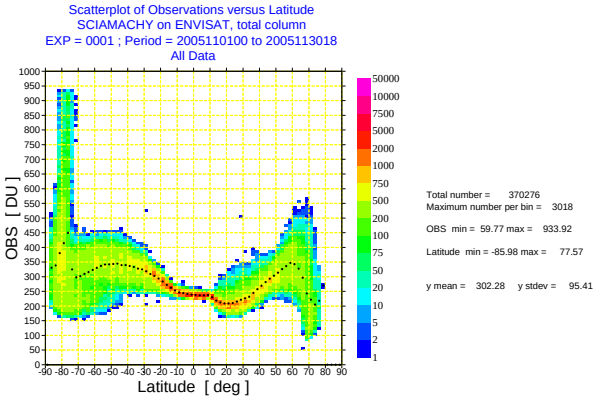

Fig. 18. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for November 2005. The colours show the number per bin, the black dots the mean values per bin.

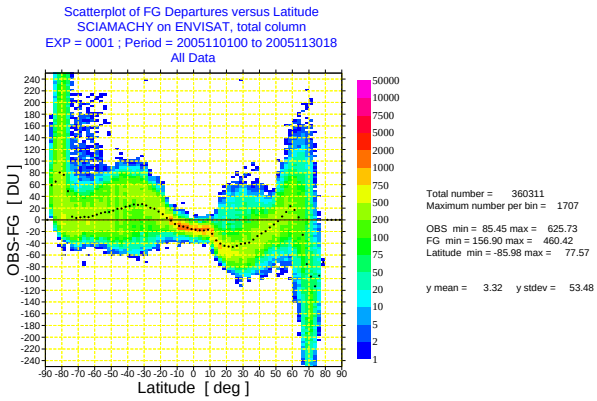

Fig. 19. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for November 2005. The colours show the number per bin, the black dots the mean values per bin.