REPORT ABOUT ENVISAT SCIAMACHY NRT OZONE PRODUCT (SCI_RV__2P) FOR FEBRUARY 2006

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1. Key points for February 2006

- SCIAMACHY SCI_RV__2P data quality stable
- SCIAMACHY data about 10 DU lower than ECMWF values in the global mean
- On 1 February the ECMWF operational model changed from version CY29R2 to CY30R1

2. Quality and amount of received data

This report covers SCIAMACHY NRT total column ozone data for February 2006. 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 diagrams of SCIAMACHY ozone values against first-guess and latitude values, as well as the scatter diagram of first-guess departures of SCIAMACHY ozone values against latitude.

On the 1st February the ECMWF operational model changed from version CY29R2 to CY30R1. Model version CY30R1 is a high resolution model with 91 levels in the vertical (model top raised to 0.01 hPa, corresponding to about 80 km) and T799 of horizontal truncation (about 25 km grid spacing). Among other changes, the coefficients for the linearised ozone chemistry scheme were revised (version 2.3 of Cariolle and Déqué scheme). In CY30R1 the ozone hole over Antarctic is much better captured by the model and the ozone vertical distribution in the tropical upper troposphere and lower stratosphere is also improved.

Owing to technical problems in the SCIAMACHY monitoring, the monitoring statistics were not performed between 1 and 9 February.

The timeseries plots show that SCIAMACHY data quality was stable in February. In the global mean, the timeseries plots of the first-guess and analysis departures do not exhibit a noticeable offset when the new model version was implemented. As in January, the global mean first-guess departures are still about -10 DU. However, slightly smaller departures are seen in the northern mid-latitudes, whereas slightly larger departures are observed in the southern hemisphere, in particular in the mid-latidudes. These changes in the departures might be due to the new coefficients in the ozone parametrization scheme.

The standard deviations of the global mean departures have not changed and are still about 15 DU. The increase of the standard deviations of SCIAMACHY data in the northern mid-ltitudes, which has been seen since mid-January, is still observed this month.

The geographical distribution of the mean first-guess departures (Fig. 10) shows that the relatively large negative biases seen in January, roughly between 45°-70°N, in particular over northwest Pacific and Alaska, are much reduced this month. However, the large positive departures at the northern end of the orbits (around 70°N) are still observed.

The Hovmoeller diagram of the zonal mean first-guess departures (Fig. 15) further illustrates the reduction of the large negative departures north of 45°N, and the large positive departures at the northern end of the orbits.

The scatter plot of SCIAMACHY ozone values against latitude (Fig. 18) shows that the relatively large ozone values observed in the latitude band 62.5°-67.5°S since mid-December have dissapeared in February. Furthermore, the scatter plot of the first-guess departures against latitude (Fig. 19) also shows that the large negative departures seen in the northern extratropics in January are much reduced, and that the large positive first-guess departures at the northern high latitudes are still present.

The data gap seen in the timeseries diagrams between 1 and 9 February is due to the monitoring problems above-mentioned.

3. Remarks

This monitoring report was produced with the operational ECMWF model (CY30R1). 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).

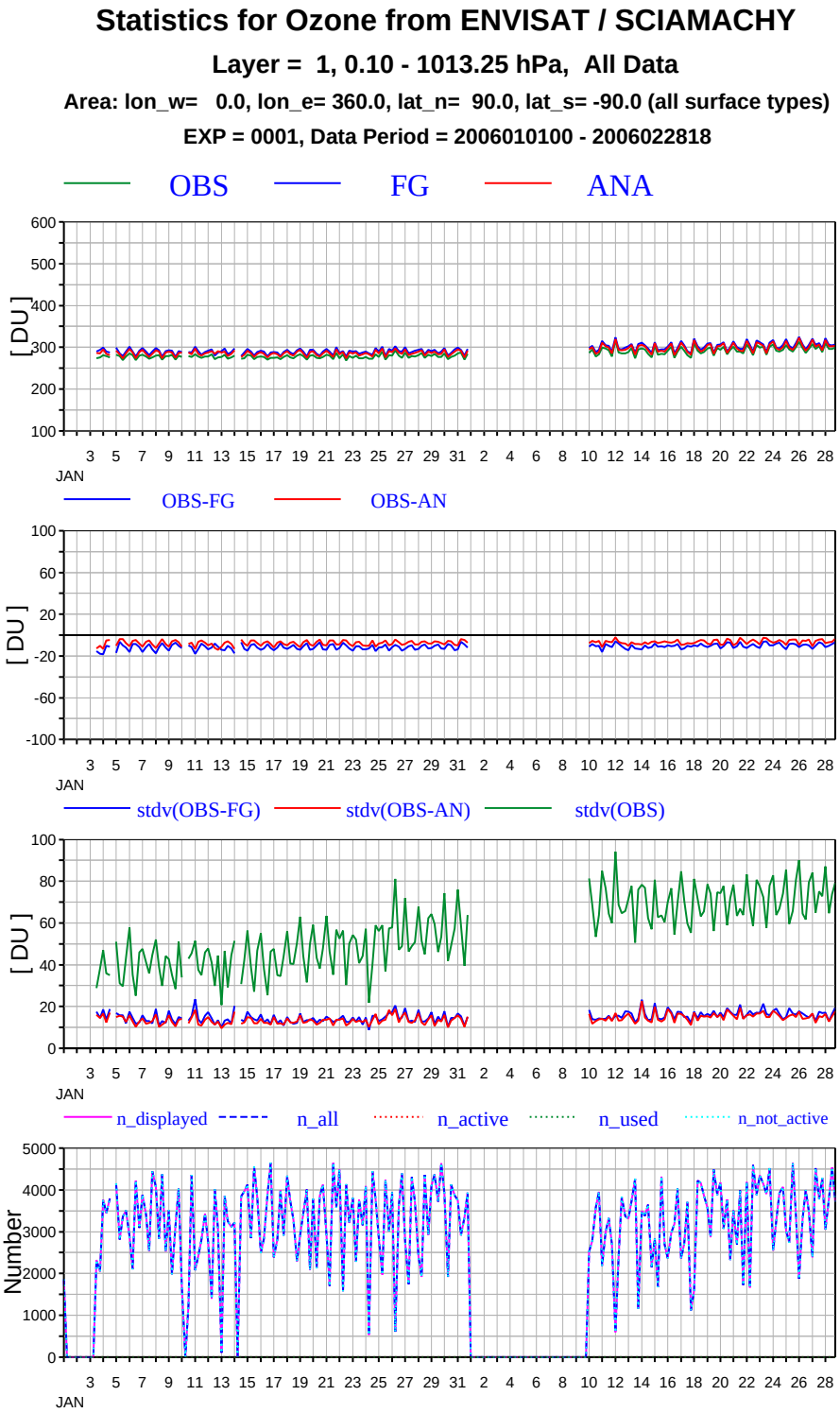

Fig. 1. Time series of mean observations, first guess and analysis values (top panel), first-guess and analysis departures (second panel), standard deviations (third panel) and number of data (bottom panel) per 6-hour cycle for ENVISAT SCIAMACHY NRT ozone data for January and February 2006 (Global means).

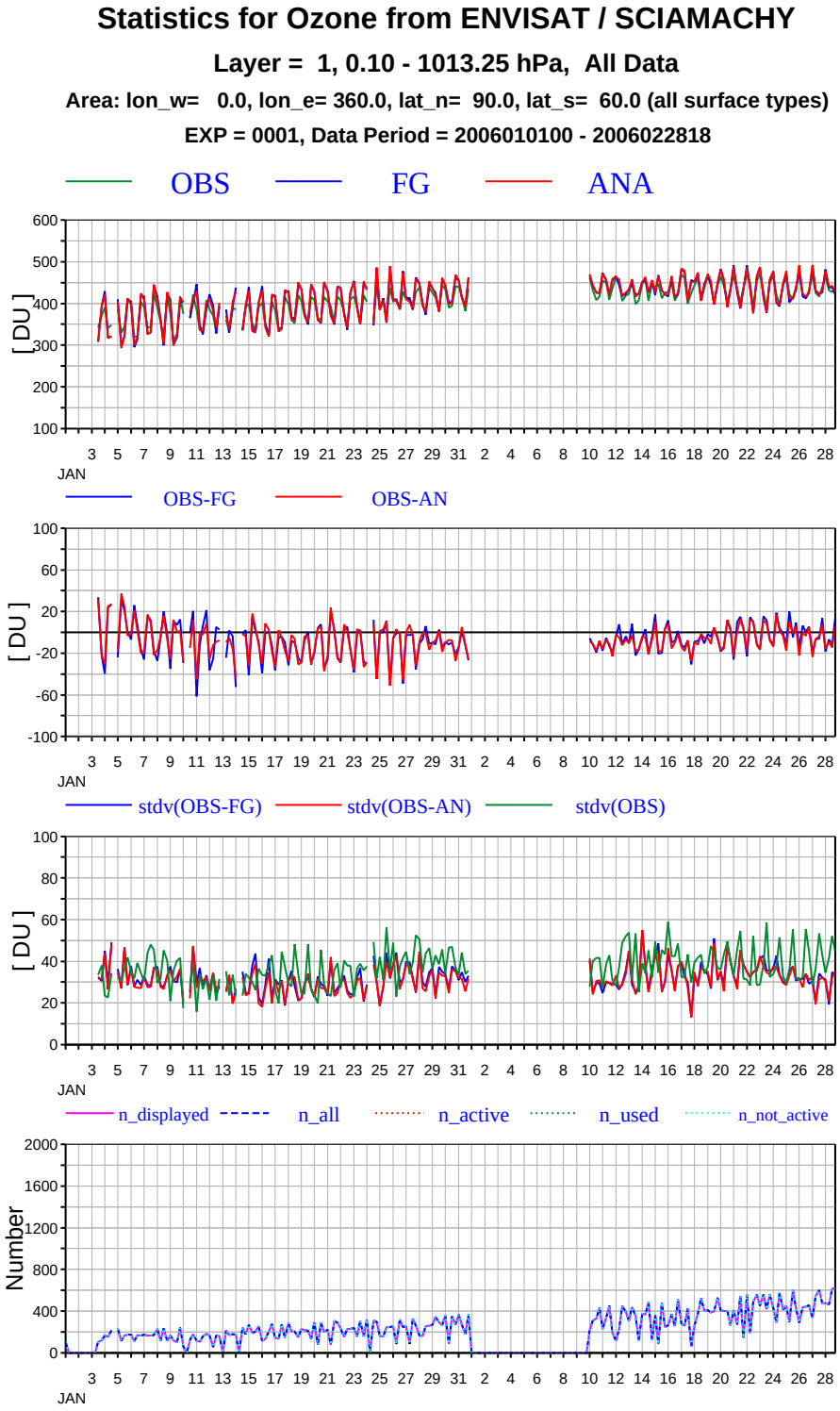

Fig. 2. As Fig.1 but for 90-60N.

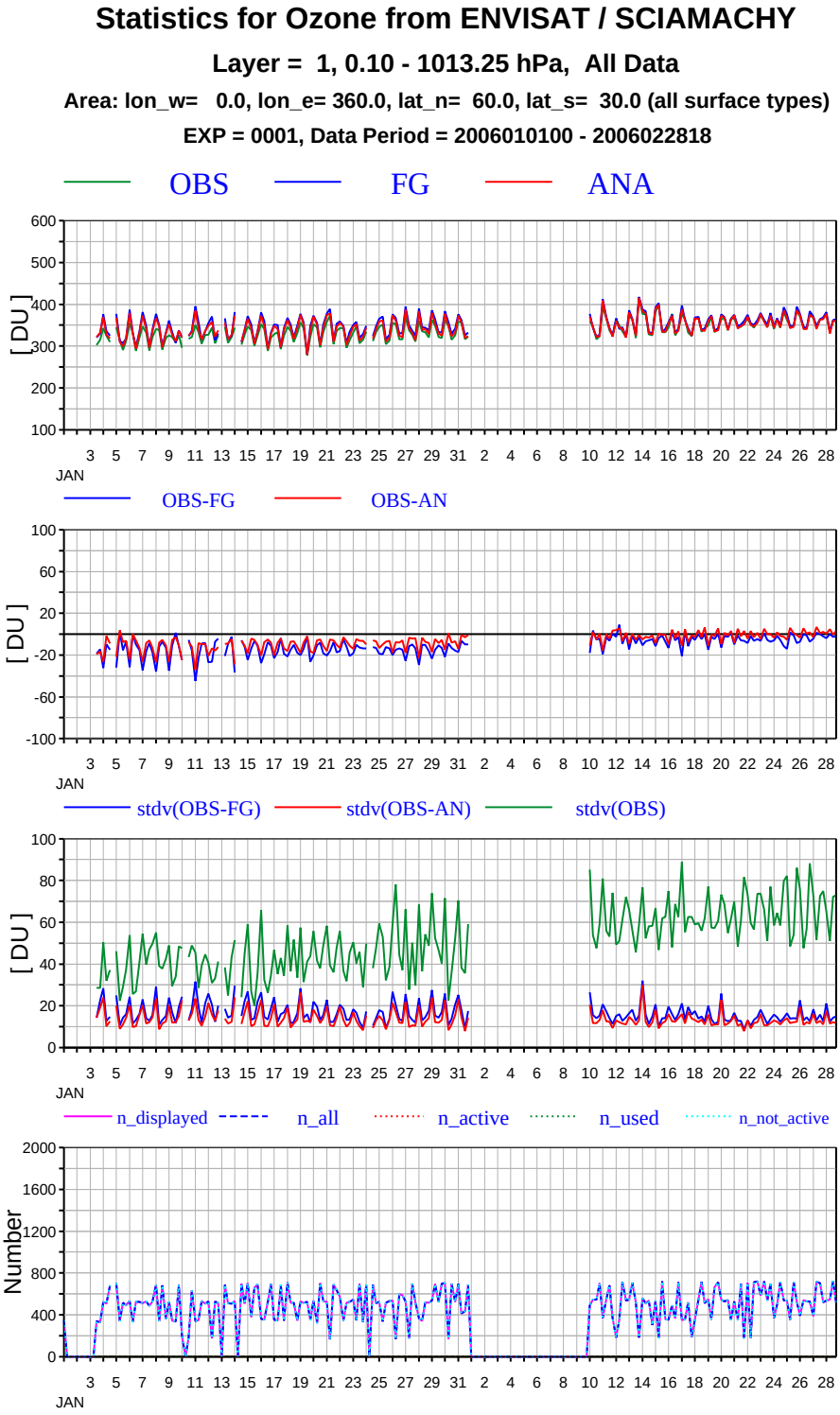

Fig. 3. As Fig. 1 but for 60-30N.

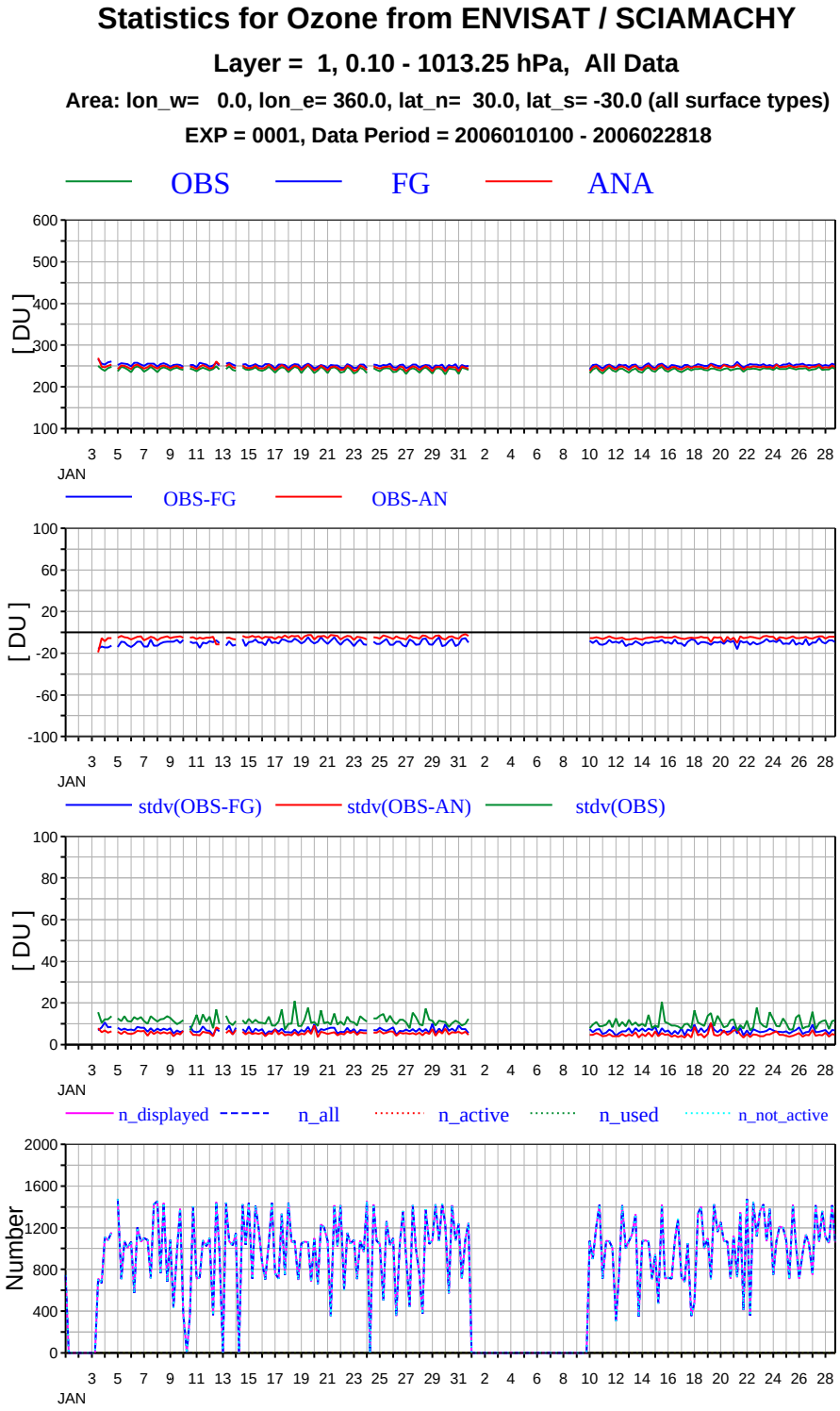

Fig. 4. As Fig. 1 but for 30N-30S.

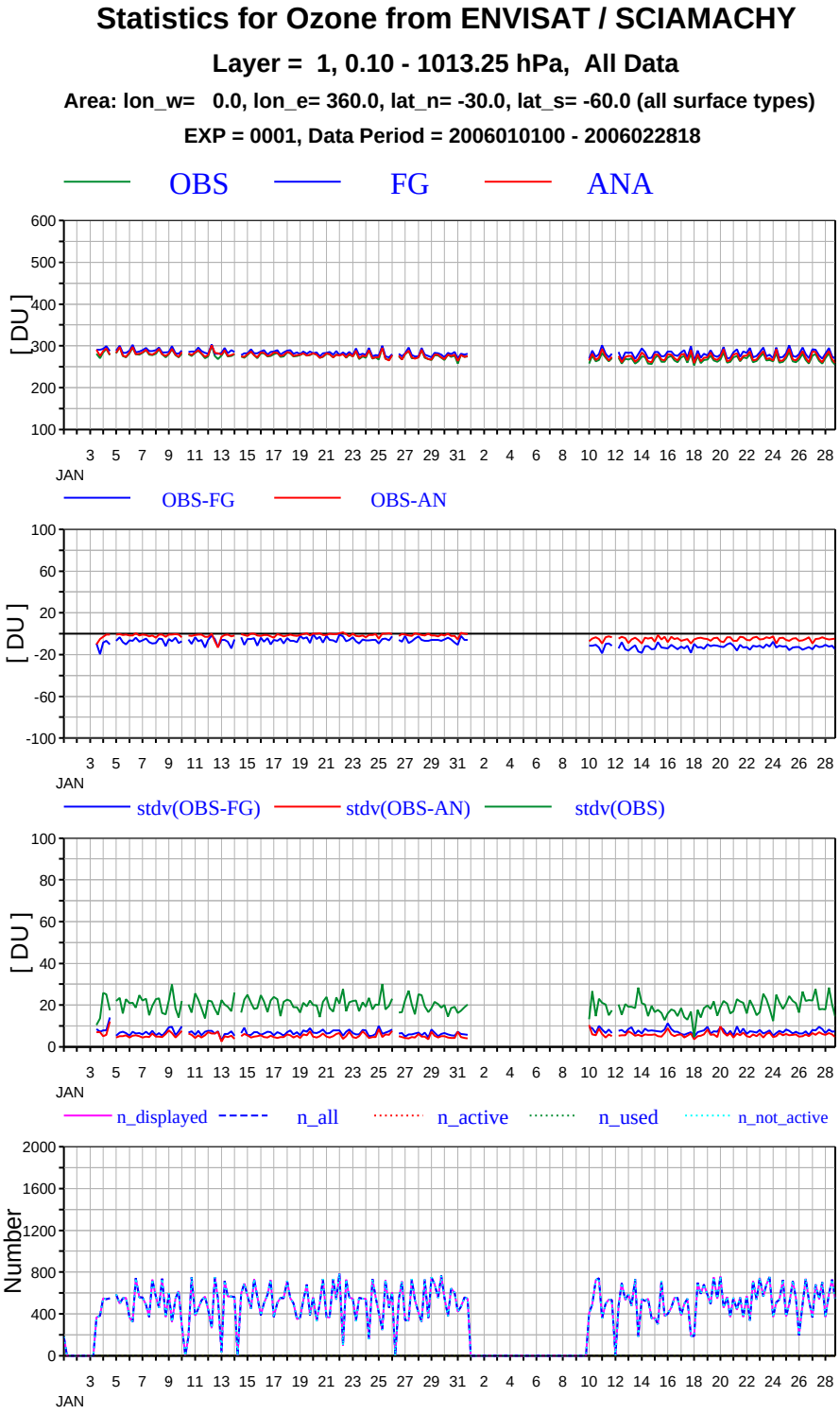

Fig. 5. As Fig. 1 but for 30-60S.

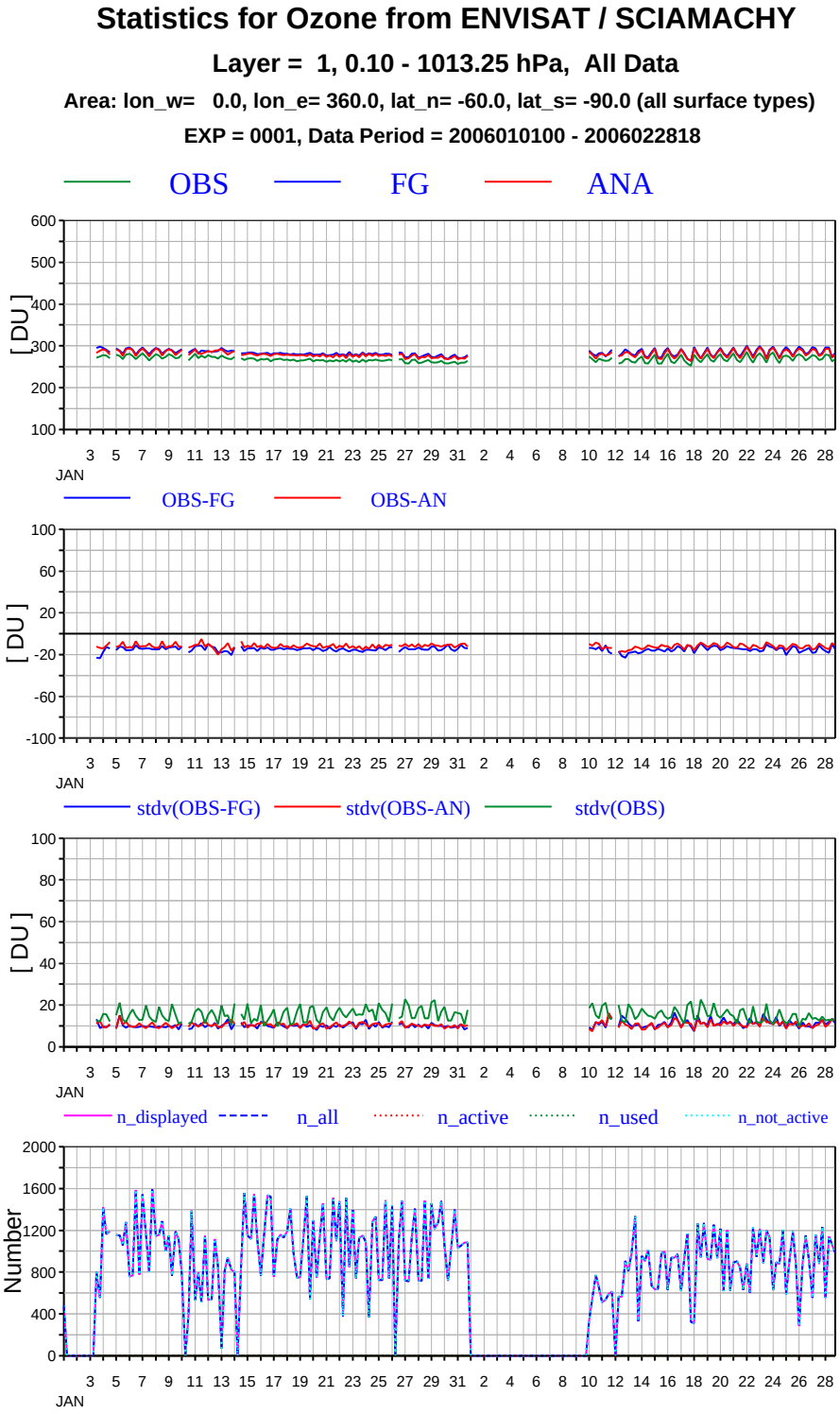

Fig. 6. As Fig. 1 but for 60-90S.

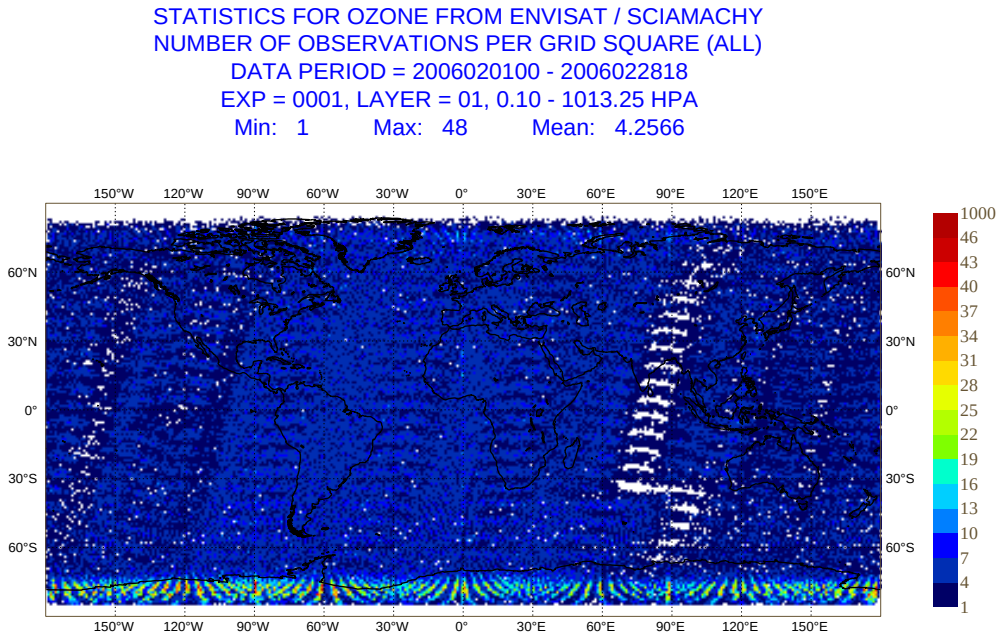

Fig. 7. Geographical distribution of mean number of data for ENVISAT SCIAMACHY NRT ozone data for February 2006.

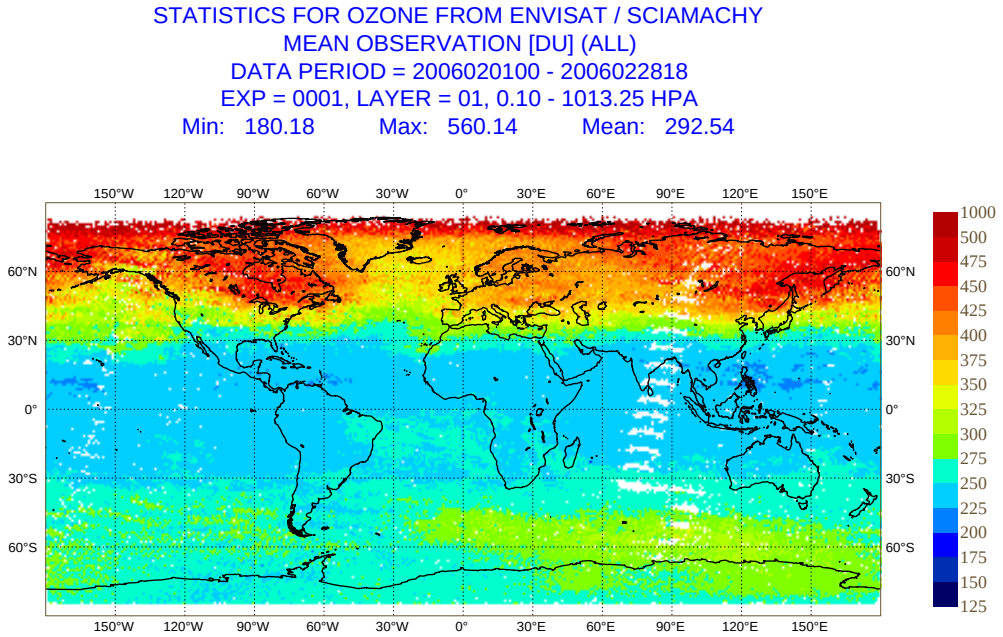

Fig. 8. Geographical distribution of mean observation values for ENVISAT SCIAMACHY NRT ozone data for February 2006.

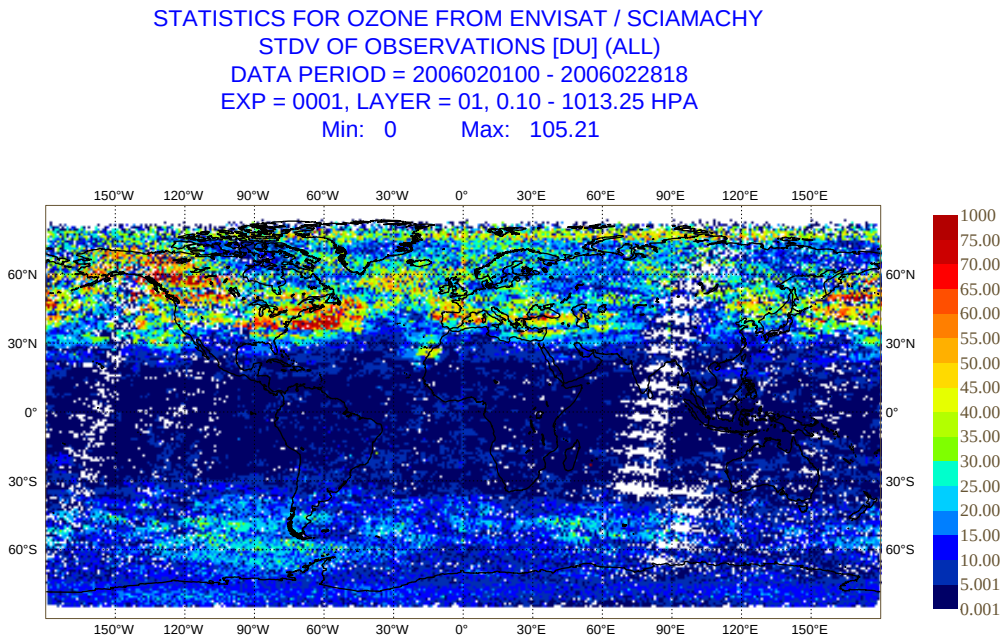

Fig. 9. Geographical distribution of the standard deviation of the mean observation values for ENVISAT SCIAMACHY NRT ozone data for February 2006.

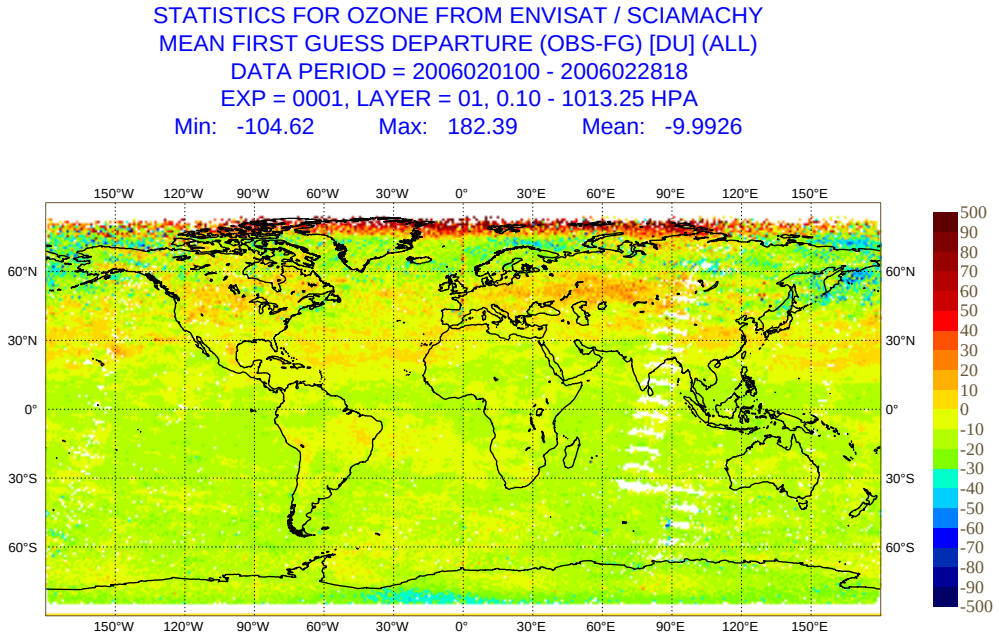

Fig. 10. Geographical distribution of mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for February 2006.

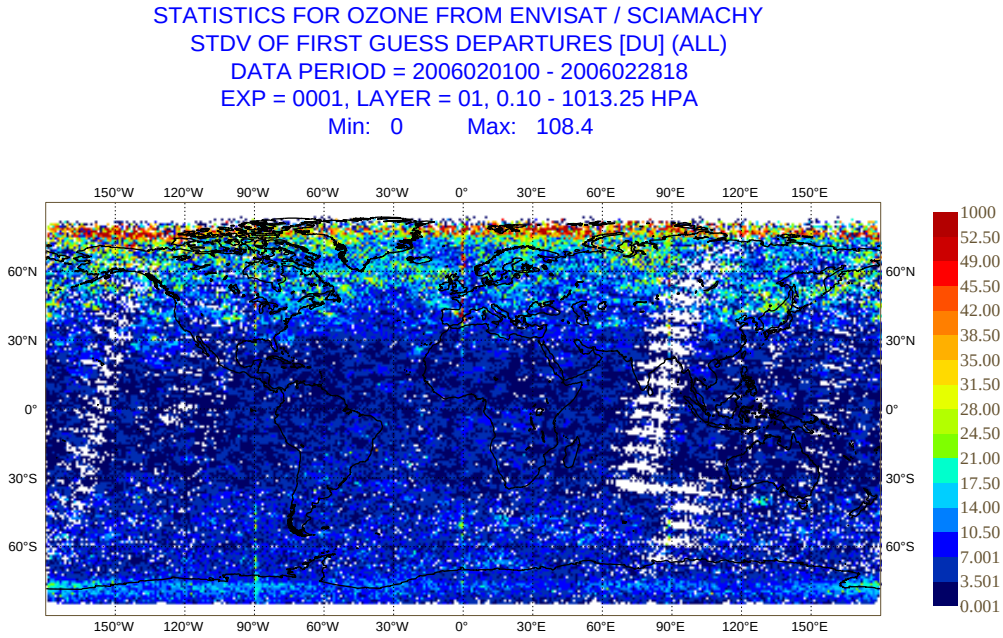

Fig. 11. Geographical distribution of the standard deviation of the mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data for February 2006.

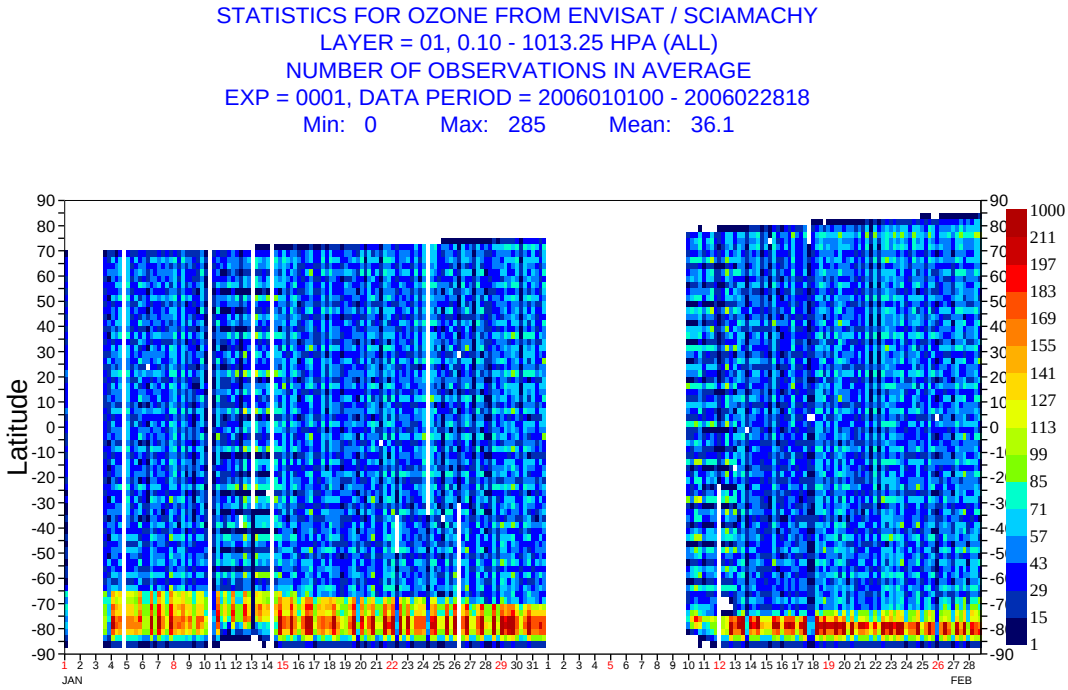

Fig. 12. Hovmoeller diagram of zonal mean number of data for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for January and February 2006.

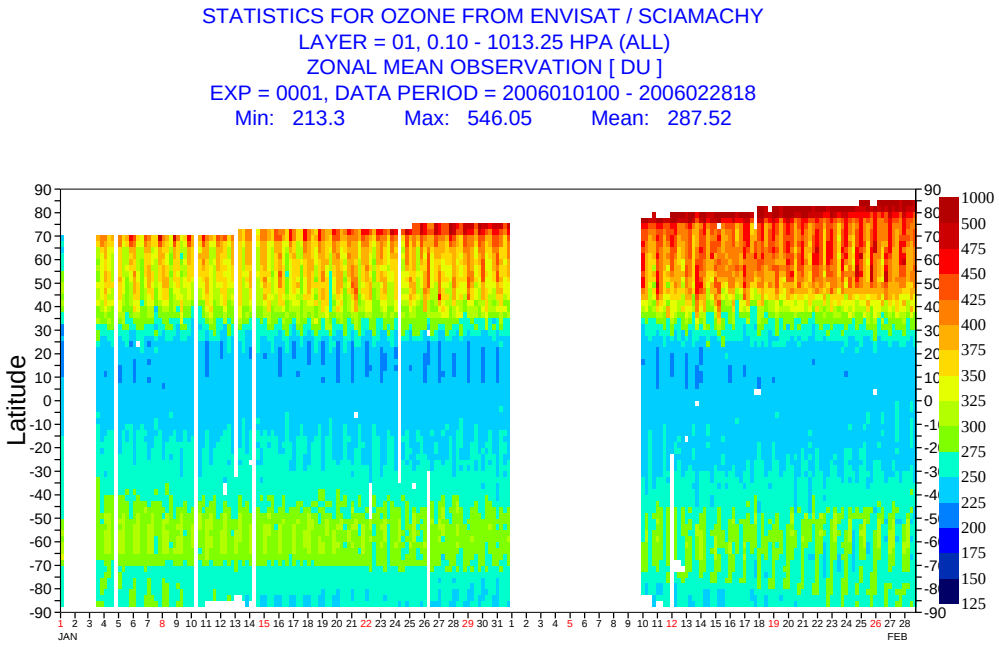

Fig. 13. Hovmoeller diagram of zonal mean observation values for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for January and February 2006.

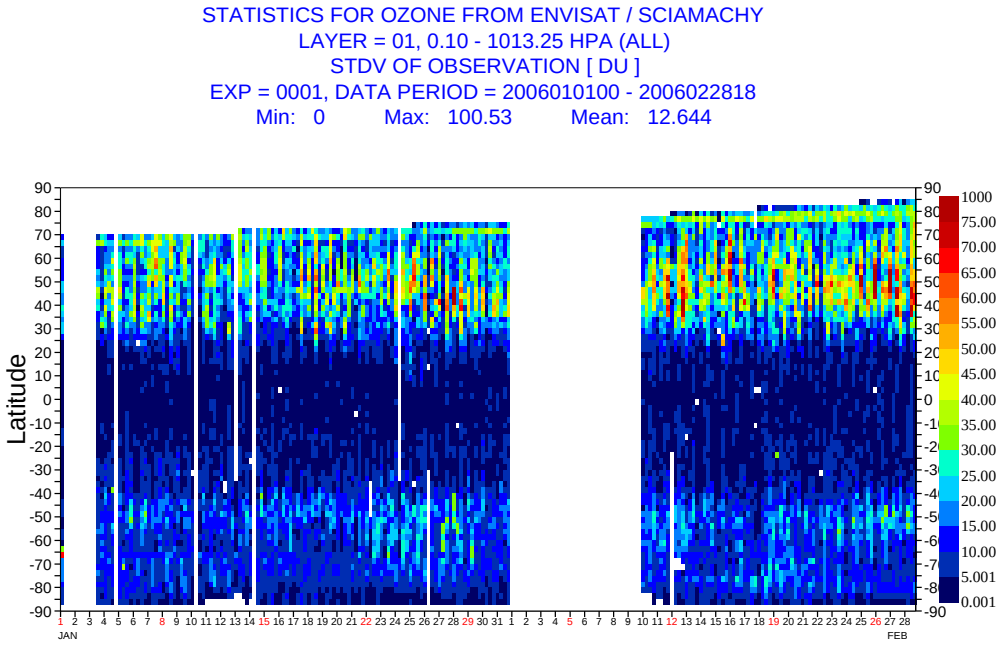

Fig. 14. Hovmoeller diagram of the zonal mean observation standard deviations for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for January and February 2006.

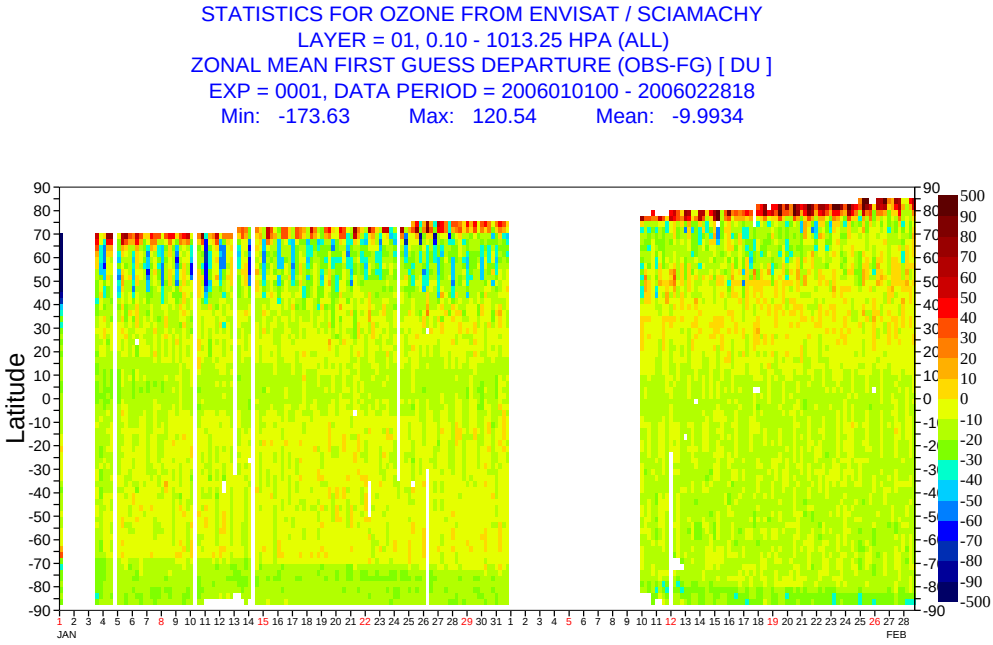

Fig. 15. Hovmoeller diagram of zonal mean first-guess departures for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for January and February 2006.

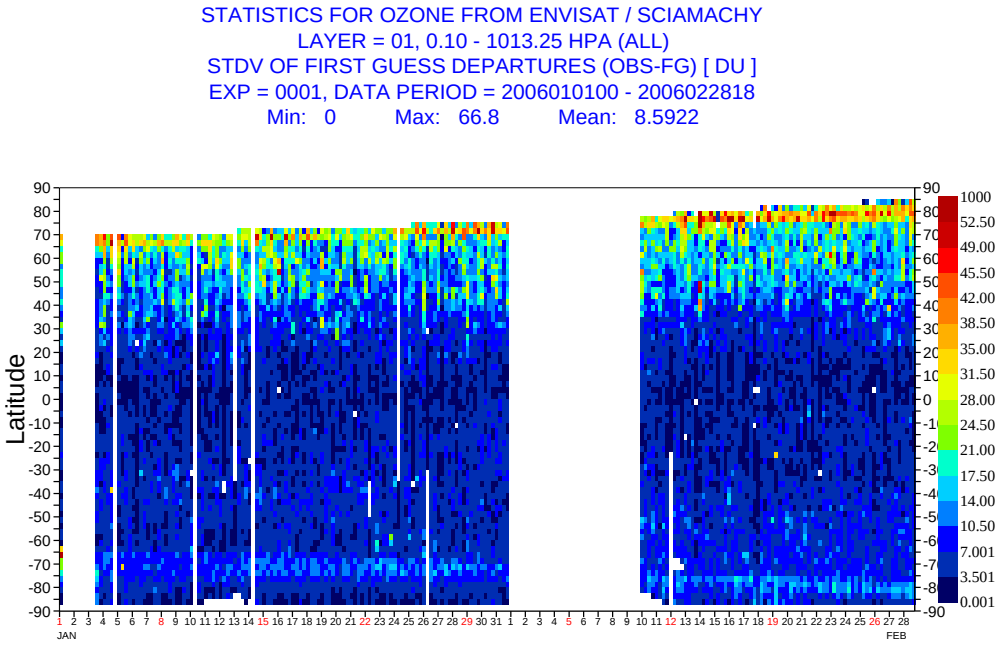

Fig. 16. Hovmoeller diagram of zonal mean first-guess departures standard deviations for ENVISAT SCIAMACHY NRT ozone data per 6-hour cycle for January and February 2006.

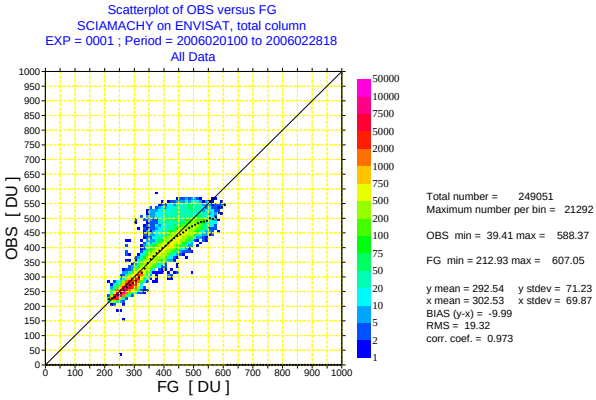

Fig. 17. Scatter plot of ENVISAT SCIAMACHY ozone values against first-guess for February 2006. The colours show the number per bin, the black dots the mean values per bin.

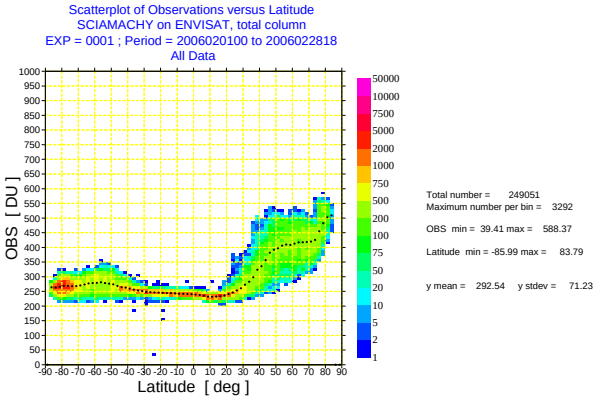

Fig. 18. Scatter plot of ENVISAT SCIAMACHY ozone values against latitude for February 2006. The colours show the number per bin, the black dots the mean values per bin.

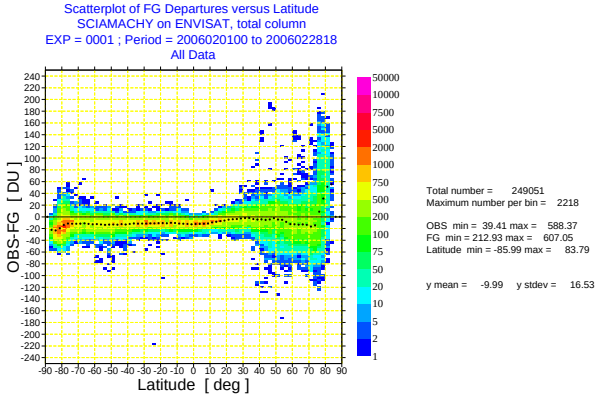

Fig. 19. Scatter plot of first-guess departures of ENVISAT SCIAMACHY ozone against latitude for February 2006. The colours show the number per bin, the black dots the mean values per bin.