

# **Supplementary Data to: Impact of temperature field inhomogeneities on the retrieval of atmospheric species from MIPAS IR limb emission spectra**

## **1 Introduction**

In this supplement a thorough display of the differences between ESA L2 OFL data of ascending and descending orbit parts is presented. The retrieval results used for the analyses cover the time span from the beginning of the mission in mid 2002 to the temporary break in March 2004.

## **2 Method of data analysis**

The ESA L2 OFL data was treated in the following manner: first, all vertical profiles of volume mixing ratios were interpolated onto a fixed reference pressure grid, having the equivalent of a 1 km vertical step. Then the whole data set was separated into data of geolocations of ascending and of descending orbit parts. In the next step each of these ascending/descending subsets was sorted into time bins of 30.4369 days (representing the length of a mean month) and latitude bins of  $15^\circ$ . Finally, mean profiles within the time/latitude bins were calculated. Hence for each bin there are two mean profiles: one calculated from profiles of the ascending and one calculated from profiles of the descending part of the orbit.

## **3 Method of data presentation**

In the following we present mean profiles, which are calculated as mean of ascending and descending profiles, difference profiles, which represent the differences of the means between ascending and descending data (i.e. ascending minus descending), and relative differences, which are the latter divided by the former. Atmospheric pressure is used as the vertical coordinate.

In all figures mean profiles are shown in the left column, differences (ascending minus descending) in the middle and relative differences in the right column. Each row represents a latitude band of width  $15^\circ$ . For each L2 product there are two figures, the first one contains plots for southern, the second for northern hemispheric data. Data is presented for temperature in Figs. 1 and 2, for  $\text{HNO}_3$  in Figs. 3 and 4, for  $\text{O}_3$  in Figs. 5 and 6, for  $\text{H}_2\text{O}$  in Figs. 3 and 4, for  $\text{CH}_4$  in Figs. 9 and 10, and for  $\text{N}_2\text{O}$  in Figs. 11 and 12.

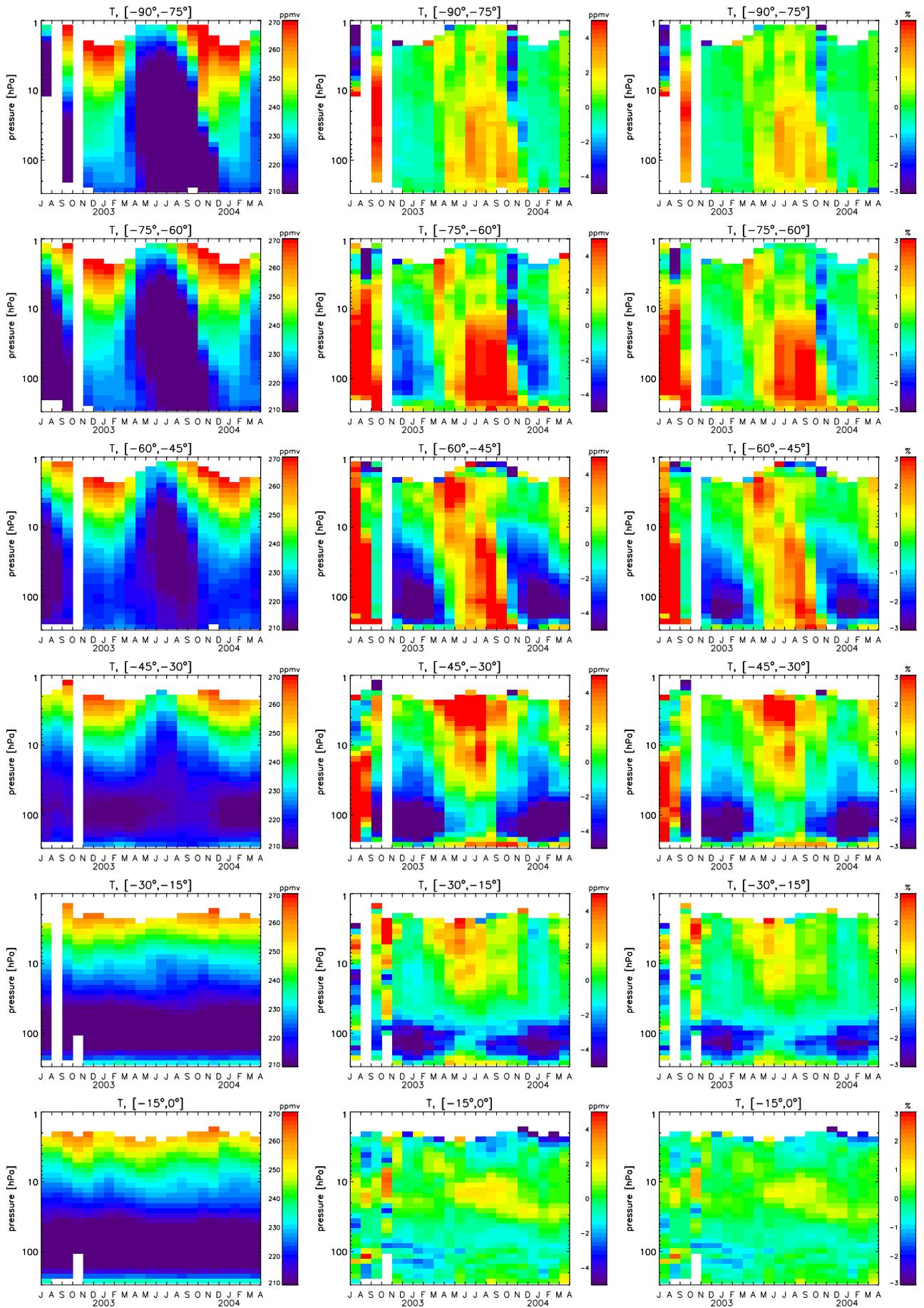


Figure 1: Temperature, southern hemisphere.

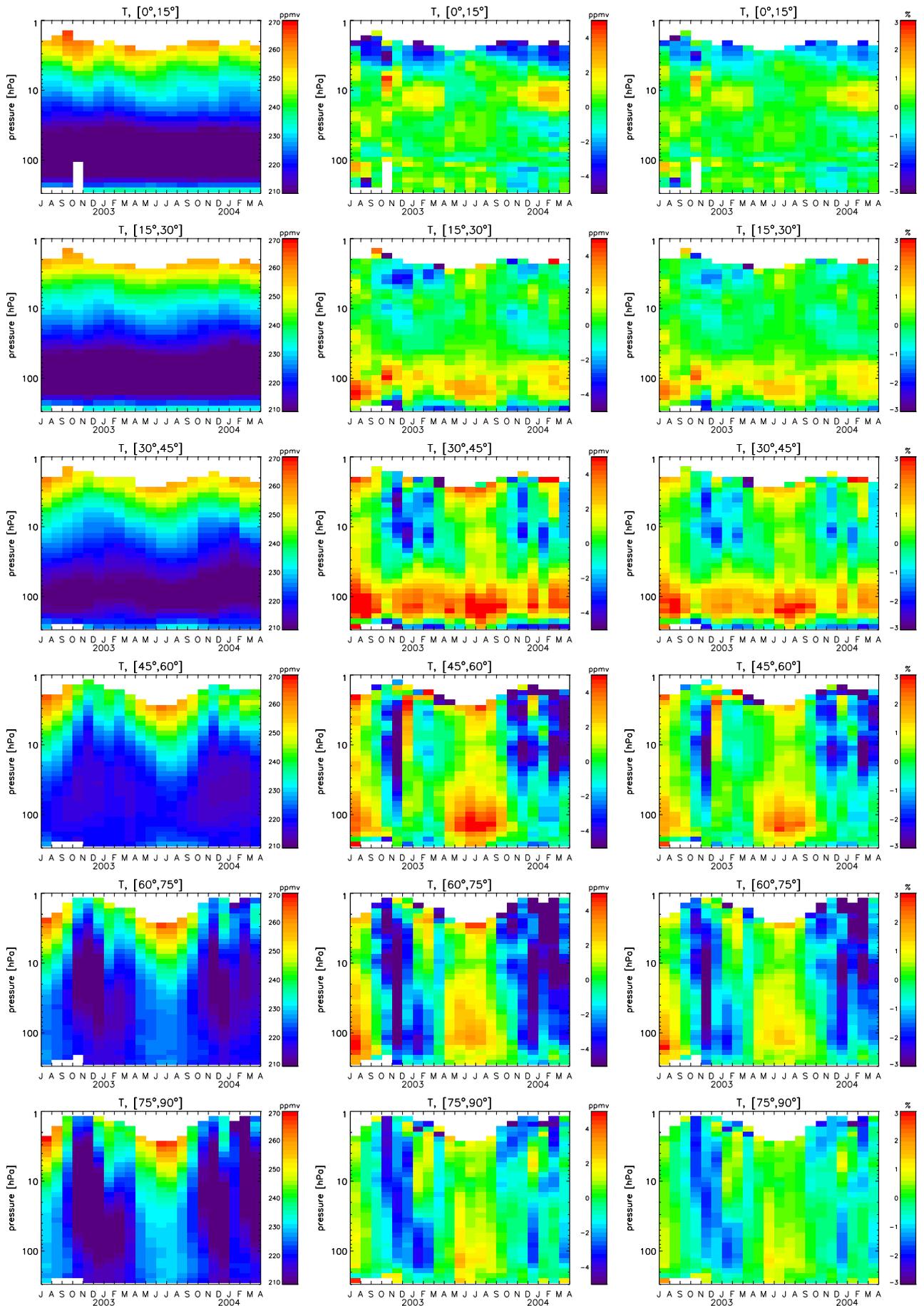


Figure 2: Temperature, northern hemisphere.

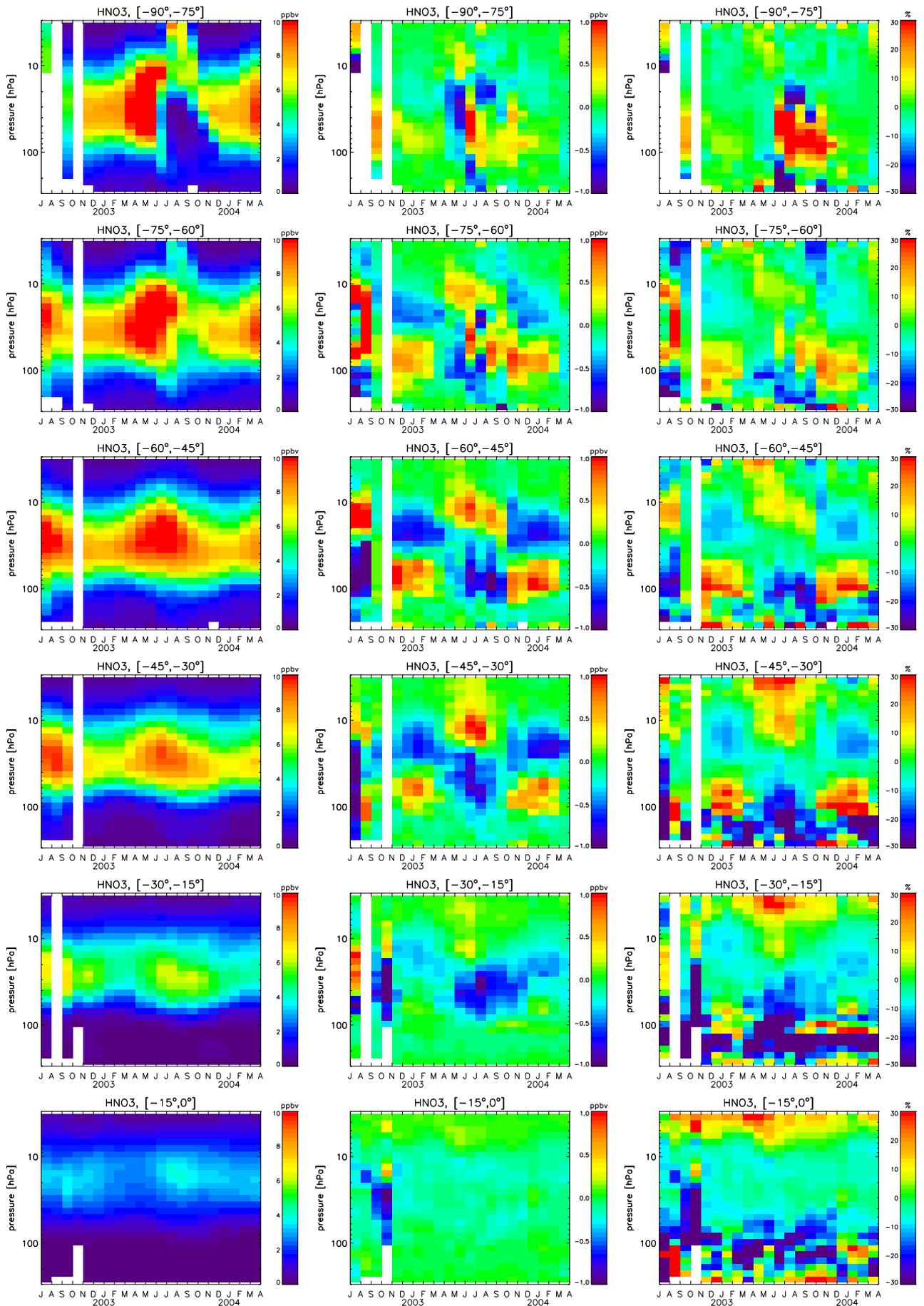


Figure 3: Nitric acid, southern hemisphere.

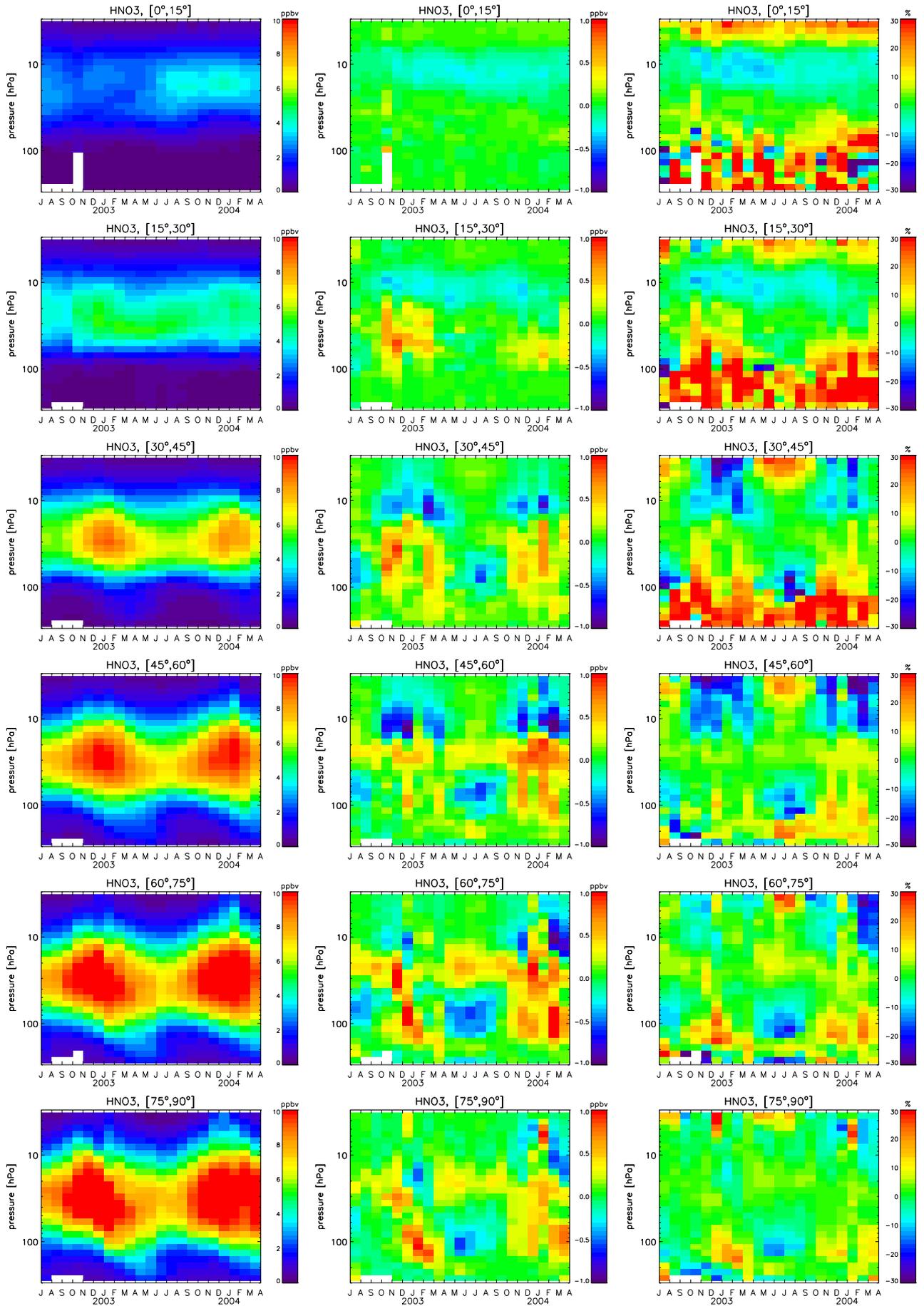


Figure 4: Nitric acid, northern hemisphere.

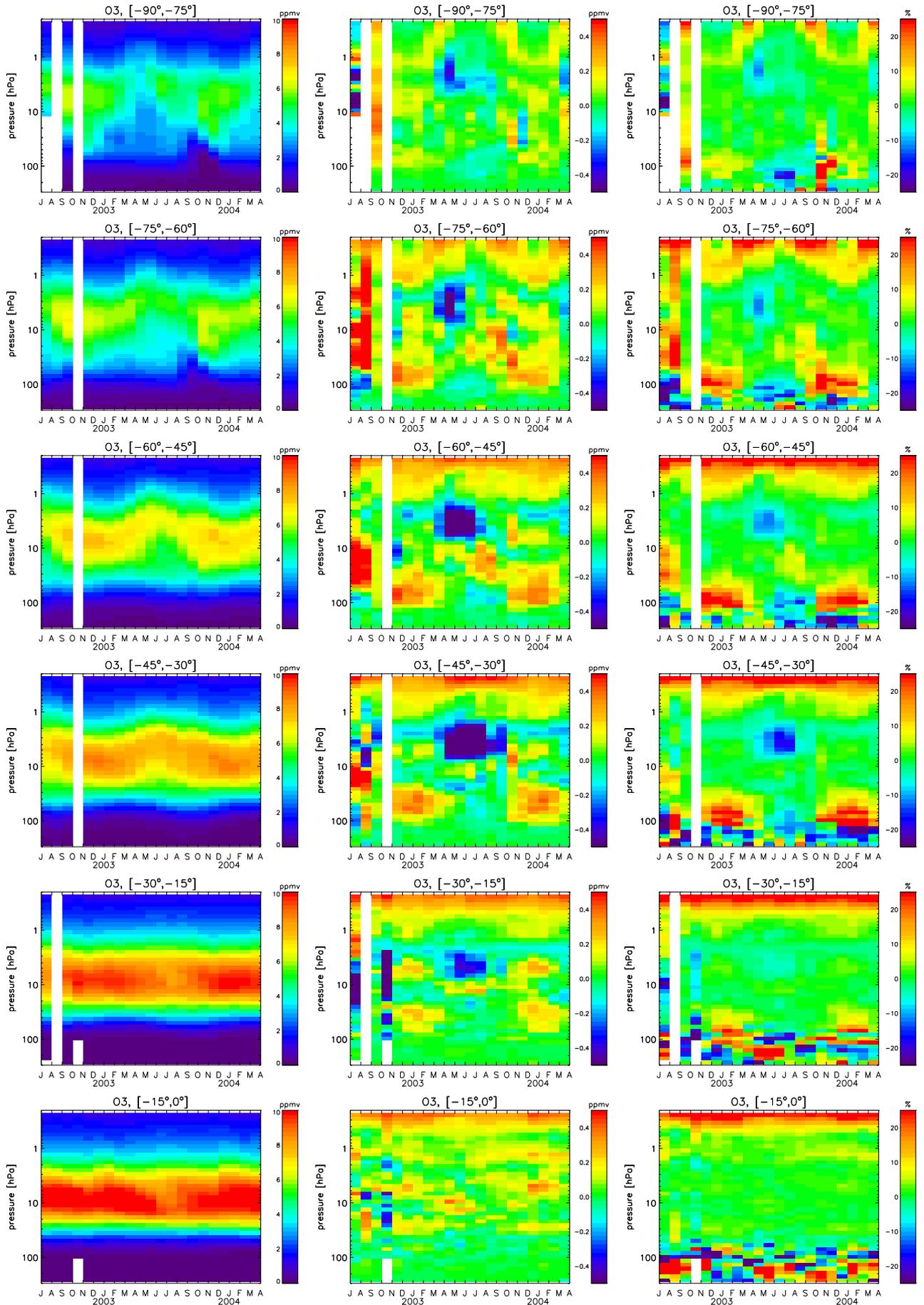


Figure 5: Ozone, southern hemisphere.

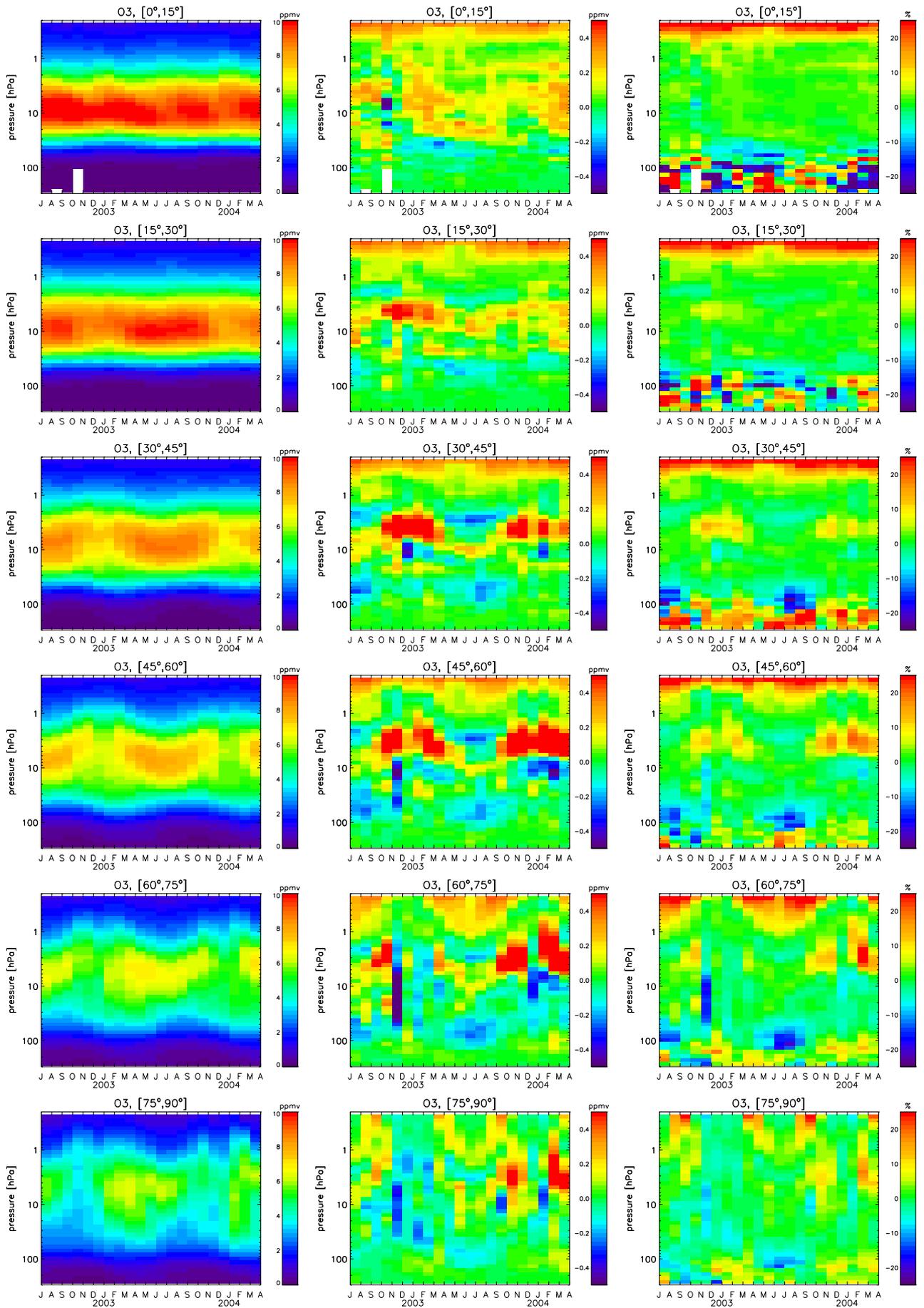


Figure 6: Ozone, northern hemisphere.

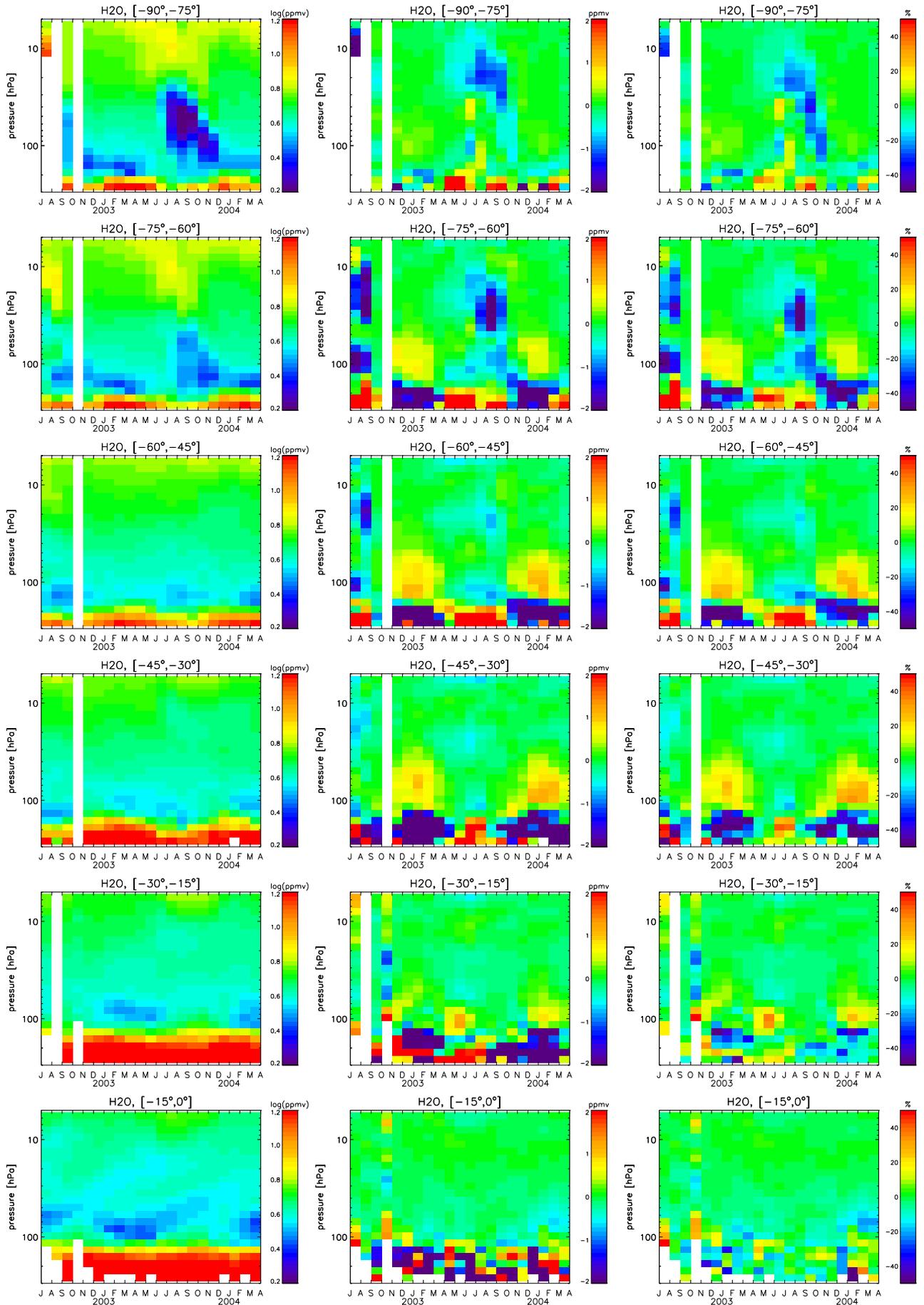


Figure 7: Water vapour, southern hemisphere.

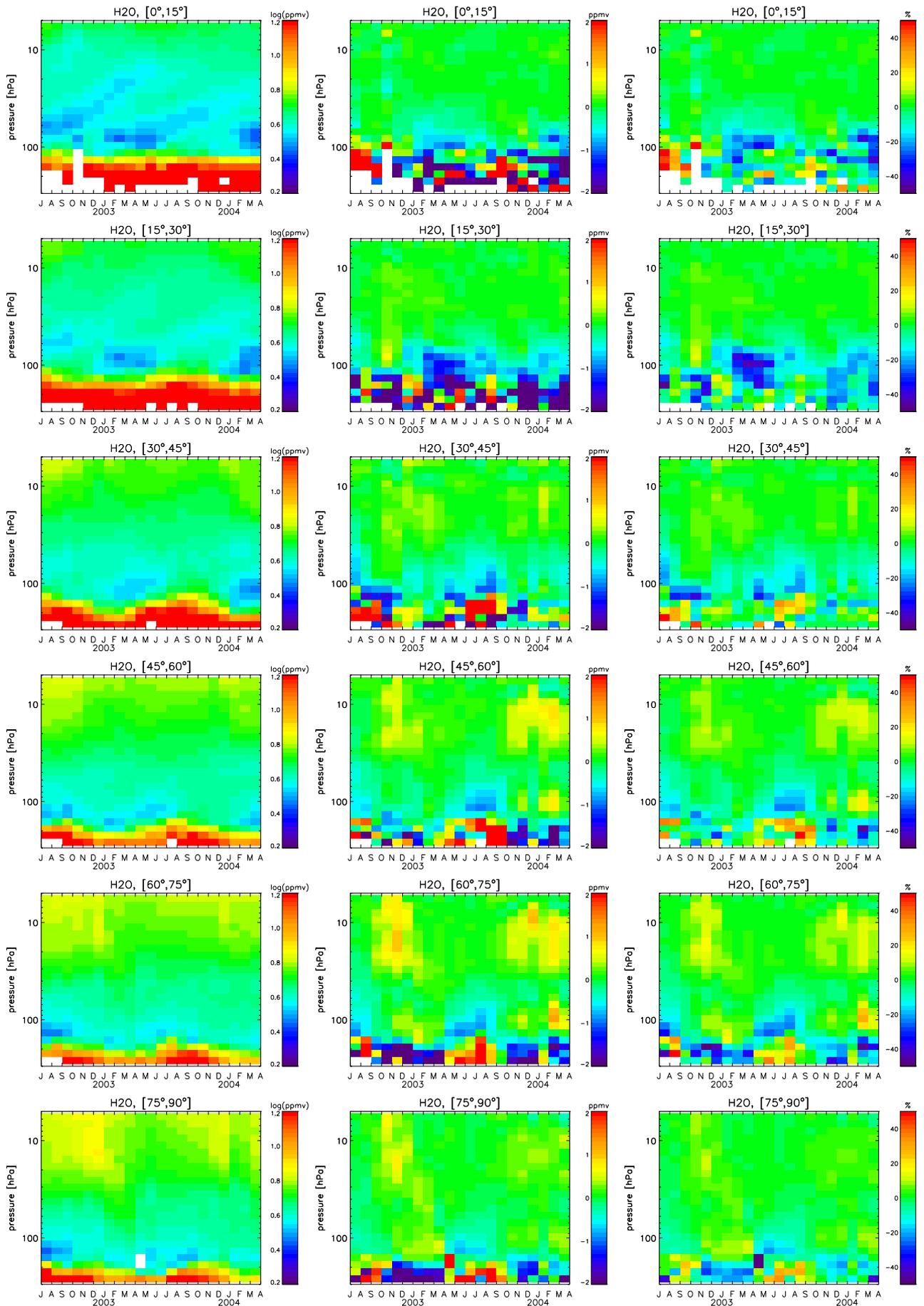


Figure 8: Water vapour, northern hemisphere.

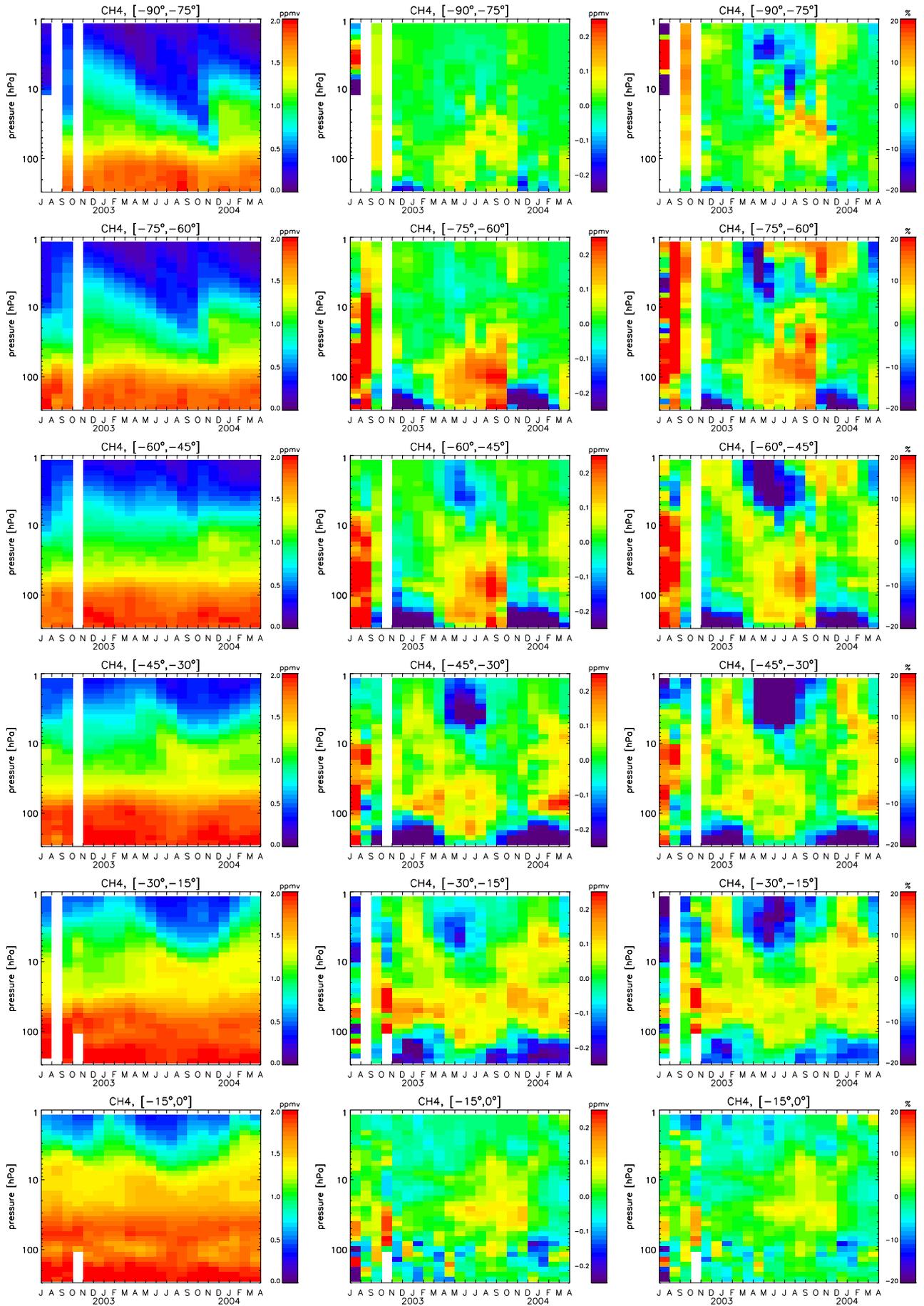


Figure 9: Methane, southern hemisphere.

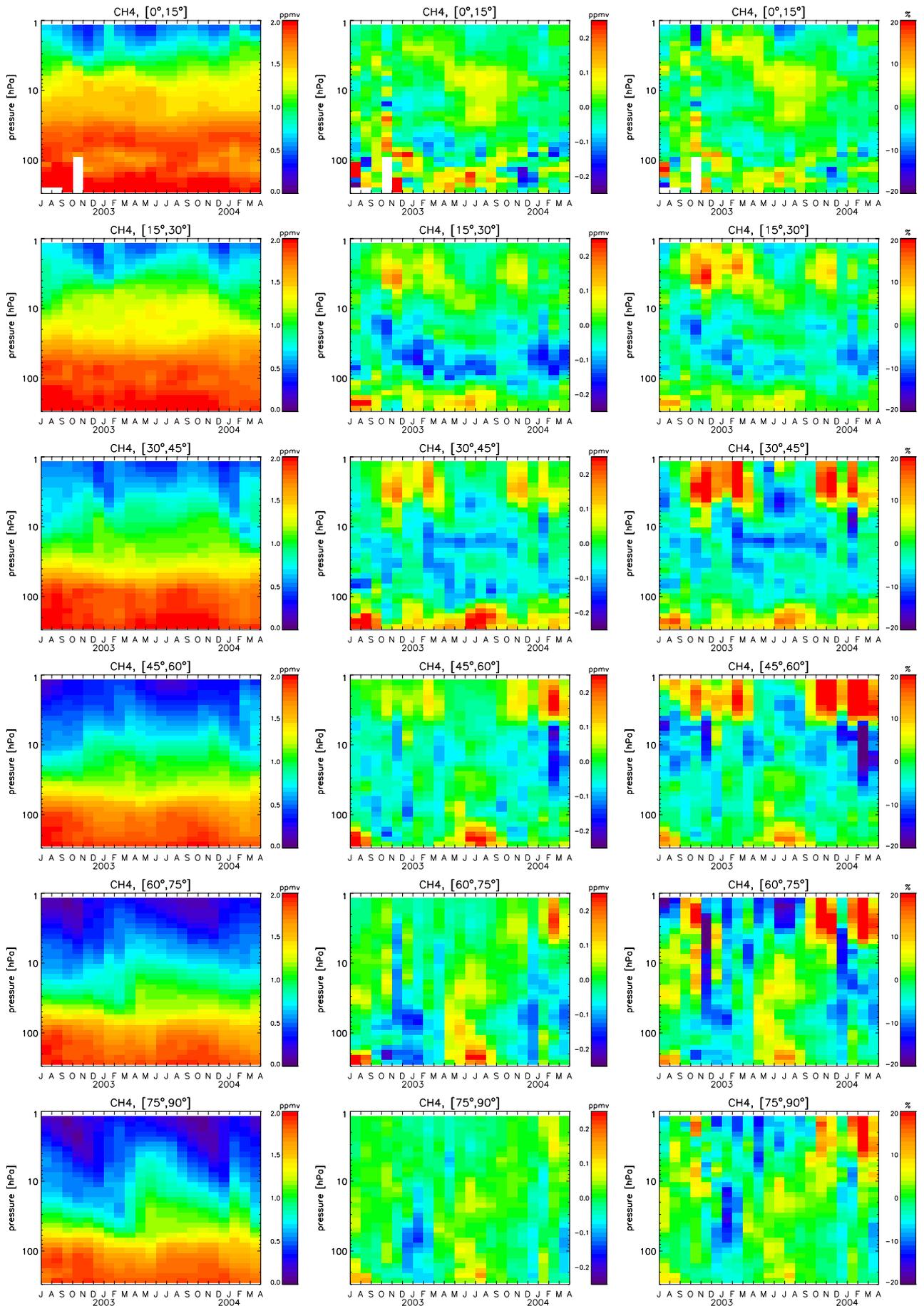


Figure 10: Methane, northern hemisphere.

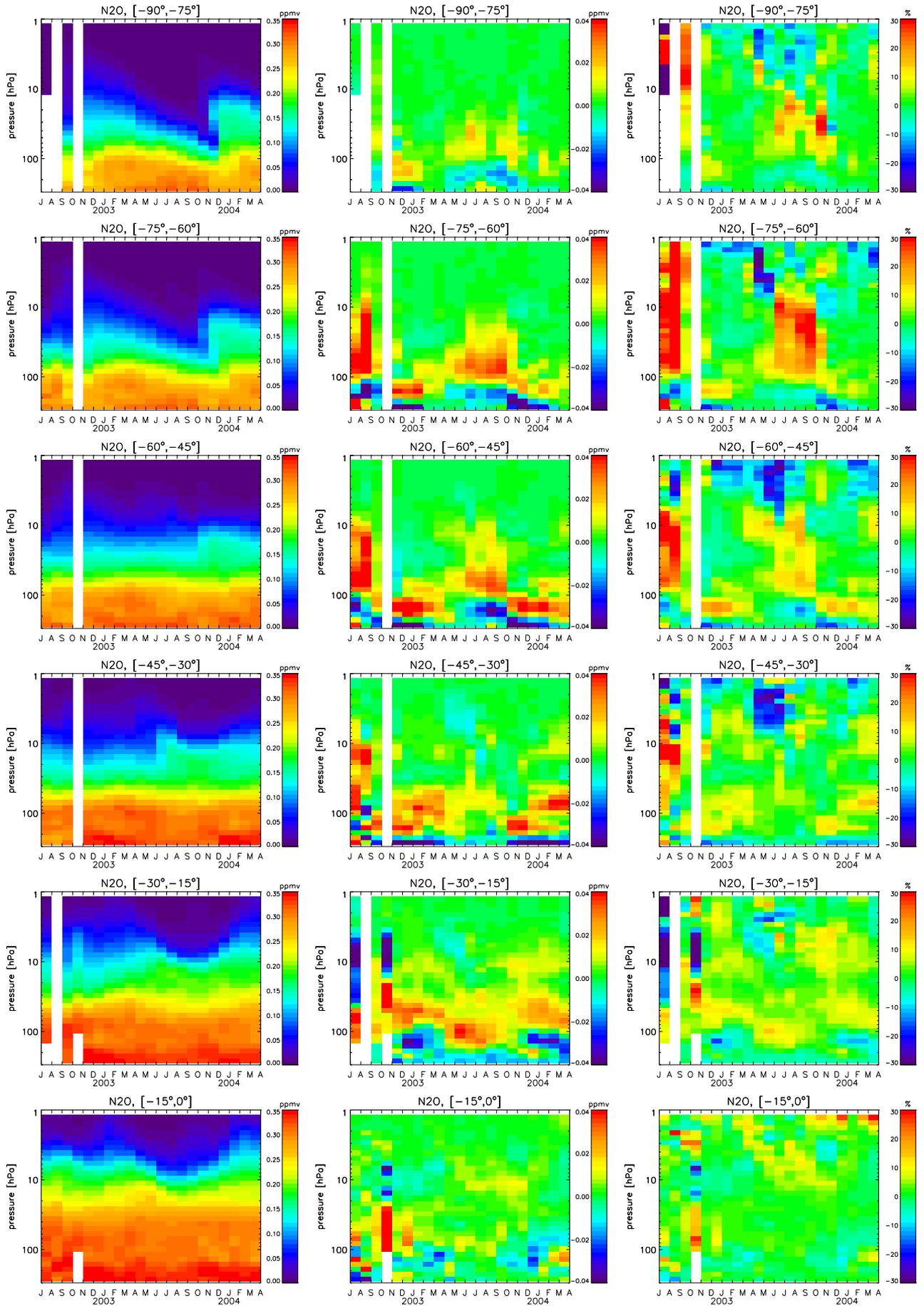


Figure 11: Nitrous oxide, southern hemisphere.

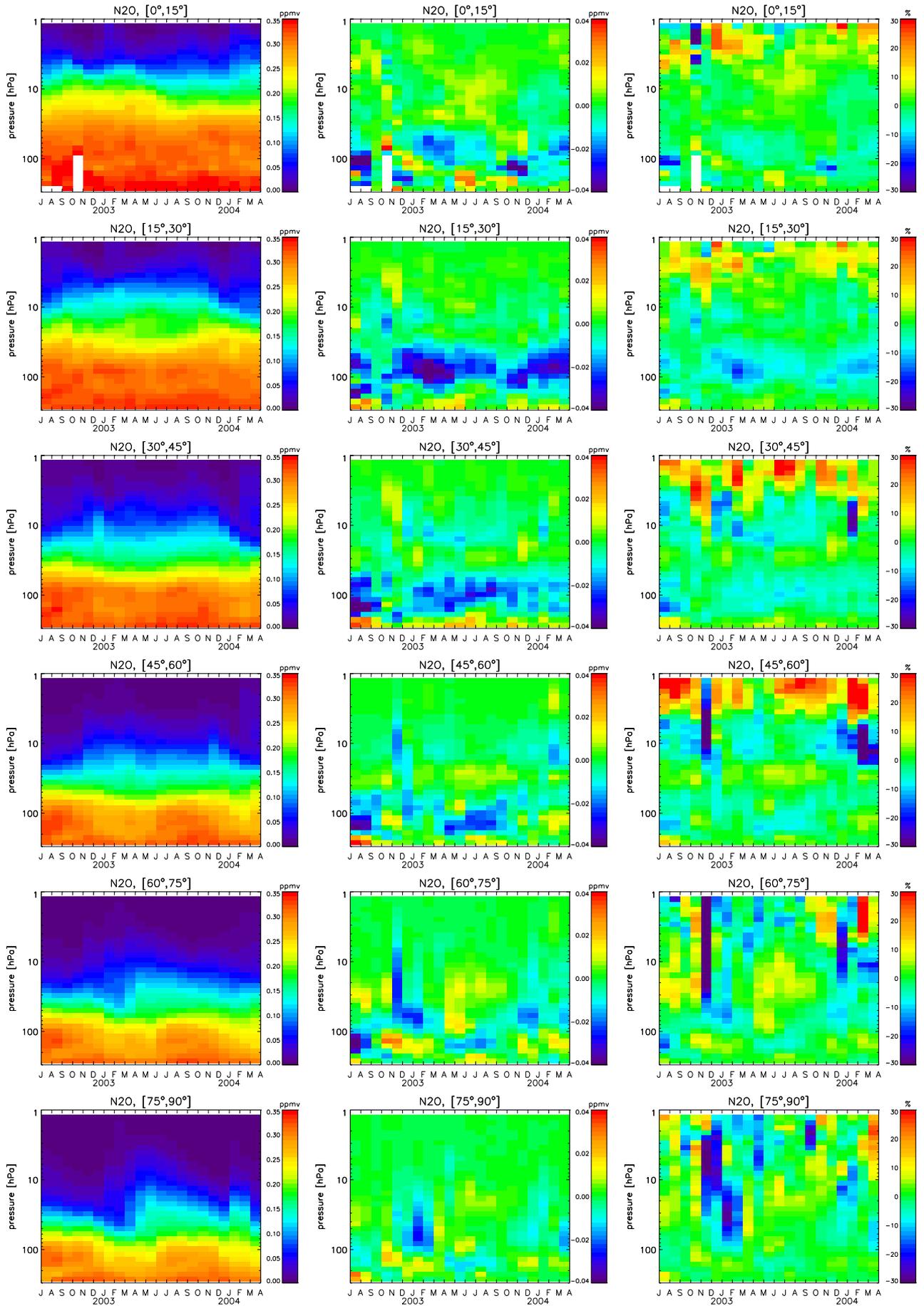


Figure 12: Nitrous oxide, northern hemisphere.