Intercomparison of MIPAS Near Real Time and Offline Data Products

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ABSTRACT

There are two end-user level 2 data resources provided by ESA for MIPAS users. These are the 'Near Real Time (NRT)' and 'Offline' datasets. We investigate the differences observed between these products over a large number of profiles, to assist in validating their mutual consistency and determining the effect of the differing data processing routes.

INTRODUCTION

To date, NRT data has been commonly used within the MIPAS validation community. The NRT data was primarily designed for use in situations where accuracy could be traded for fast turnaround and data receipt, such as volcanic monitoring and field campaigns. The Offline product uses consolidated level 1B data and consists of complete orbits that start at a fixed geolocation with more accurate orbital state parameters. The retrieval is permitted to iterate to convergence, and contains more levels (down to 6km instead of 12km for NRT data). Other small differences exist.
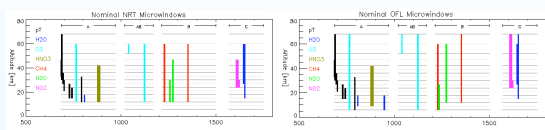

Figure 1: Differences in microwindow altitude ranges.

DISCUSSION

Figure 1 outlines one of these key differences – the different retrieval ranges between the datasets. The effect can be seen as increased scatter for top and bottom levels in Figure 2, which gives an overview of the mean differences, averaged over the month of November 2003, between the Offline and NRT data. It also shows the NRT monthly mean as a reference. The main observed differences were:

- PRE: 75N shows an unusual deviation.
- CH4: bottom levels improvements for OFL L2 data
- N2O: high 75N night-time mean profile in both L2 data

H2O: 60km level still problematic in OFL L2 data
HNO3: Unusual feature at 75N around 20km.
NO2: Large top level excursion [day and night]

FURTHER INFORMATION

The Oxford group performs a variety of data health monitoring. For other months and the latest information, please visit:
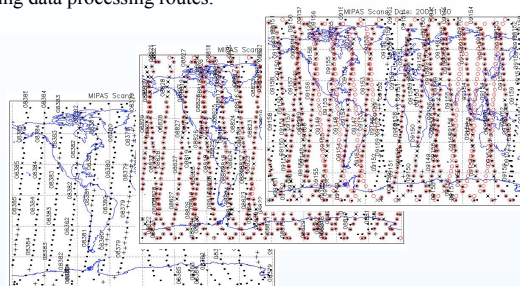
http://www.atm.ox.ac.uk/group/mipas/

Figure 3: NRT (black dots) and Offline profiles (red rings) for single days. Many months have no Offline data available (lowermost plot), some have excellent coverage.

CONCLUSIONS and OBSERVATIONS

- These initial findings show good agreement between the two product types, *but* considering the relationship between the input data, it is surprising that the *dis*agreement is so large.

- The differences observed at the uppermost and lowermost levels should be attributable to differing convergence criteria and the extended altitude range of the Offline retrieval.

- Interestingly, the NRT data seems more stable – but has been under scrutiny since launch, unlike the Offline processor.

- A one second time discrepancy, between Offline and NRT products, has been observed, reported in March 2004. Upgrading to processor version 4.61 was ineffectual, although recently the problem has disappeared.
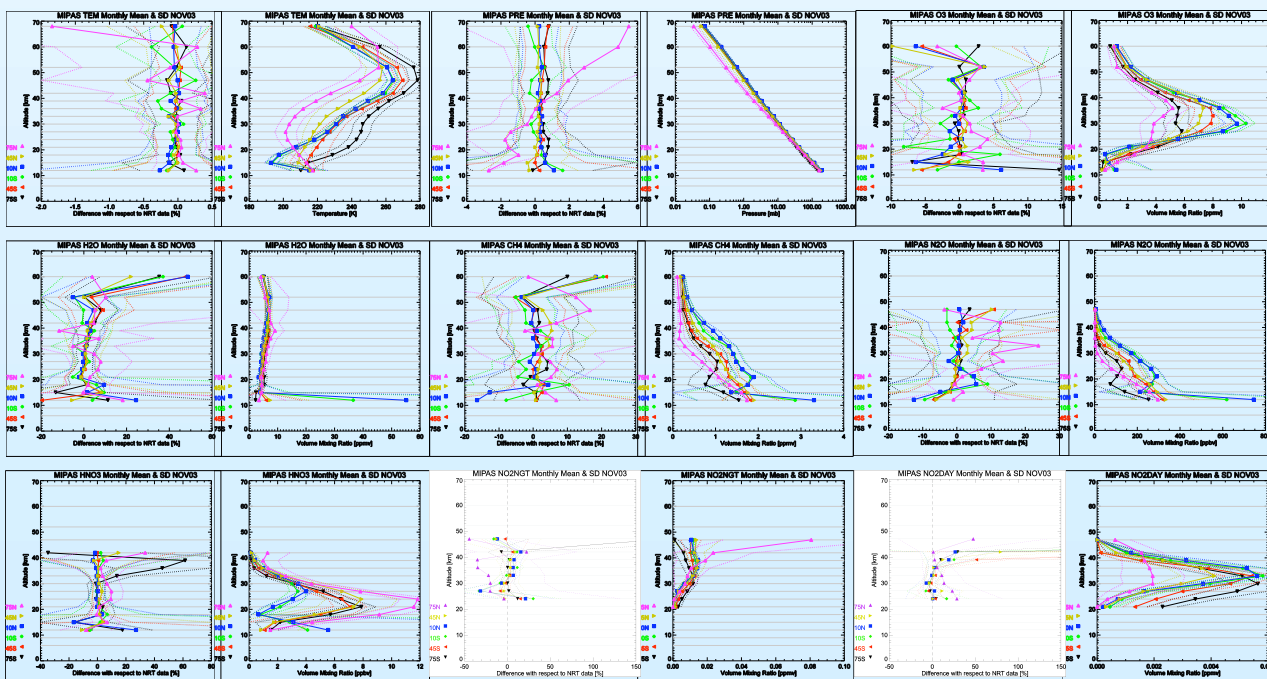

Figure 2: Plots showing mean of the differences between NRT and Offline L2 data products. November 2003 (approx. 30 days – 25,000 profiles). Different colours represent the different latitude bands over which the averaging was performed. The difference taken was 'Offline – NRT'. Adjacent to each difference is the mean NRT profile over the same latitude bands, for comparison.