**Data Treatment**

Data from the two instruments is compared and periods of disagreement (>5%) are evaluated using the database resource (i.e. inlet filter changes, instrument maintenance etc). Zero data is removed and analysed off-line (standard deviation, precision of instrument calculated, see earlier). Calibration data is removed (see notes for details of manual calibrations). Calibration data is also analysed off-line and coefficient and intercept data is recorded. The database is checked for any other potential problems to the data.

After the instrument has been off for a significant power cut (>12 hours) we remove data for the first hour of operation. Considering the treatment of outliers, data <10 ppbV and >80 ppbV is removed before submission to databases.

Treatment of spikes?

**Table of flags**

|  |  |  |  |
| --- | --- | --- | --- |
| **Flag** | **Parameter** | **Comments** | **Relevant File** |
| FAULT | Is Ozone 4 >5% of Ozone 2 | Agreement between boxes, indicates problems with one or both instruments. Can be used as a calibration. | Daily\_minute\_yymmdd\_ssmmhh |
| PO | Power cut > 12 hours | Data is removed for the first hour after a power cut that is greater than 12 hours | Daily\_minute\_yymmdd\_ssmmhh |
| OUTLIER | Data < 10 ppb or >80 ppb | Remove outlier data | Daily\_minute\_yymmdd\_ssmmhh |
| SPIKE | Spikes?? | 3 x Std deviations from mean?? Need to play with this… | Daily\_minute\_yymmdd\_ssmmhh |
| ZERO | When the zero trap is in-line | This is not yet automated so if possible pick up from the data itself. We want to perform some analysis on the zero data (see next). | Daily\_minute\_yymmdd\_ssmmhh |
| SDZERO | Standard deviation σ > 0.49 ppbV | Standard deviation of zero data | Daily\_minute\_yymmdd\_ssmmhh |
| CALIB | Calibration | Period of data lasting 200 minutes beginning and ending with 0 data. | Daily\_minute\_yymmdd\_ssmmhh |
| TEMP | Bench temp > \*\*\* | Bench Temperature too high | o3\_parameters |
| FLOW | Cell flow <0.6 | Cell flows too low | o3\_parameters |
| PRESS | Pressure > \*\* or < \*\*\* | Cell pressure | o3\_parameters |
| INT | Intensity < 20000 | Intensities too low | o3\_parameters |

NB. The o3\_parameters file contains 5 minute data and is overwritten when it gets to a certain number of lines.

A new daily\_minute file is created every day; the time in filename is when the file was created.

**Flagging notes**

Currently all of these flags are replaced with “3” invalid or missing data and the data is replaced with “9999”.

If data is particularly noisy it has in the past been flagged as 1 “reduced quality data”. Increased noise may be due to high humidity effects causing moisture in the lines (or because of other issues) but in all cases of reduced quality data the reasons for it are thoroughly investigated and the problem is solved quickly.

**Offline extra calculations from ozone data**

Use data obtained from zero to calculate precision and feed out. Is it <3?

Plot calibration data, calculate slope and intercept? If slope <3% instrument ok and in-line with SRP. Rezero only if it is clear that there is a problem with the instrument, i.e. if the standard deviation of the zero data is large (how large?? >).

**Data submission**

Near real time hourly averaged data is submitted daily to MACC (Monitoring Atmospheric Composition and Climate: [www.gmes-atmosphere.eu](http://www.gmes-atmosphere.eu)) as part of the European GMES (Global Monitoring for Environment and Security) programme and the ACTRIS (Aerosols, Clouds, and Trace Gases Research Infrastructure Network: <http://www.actris.net/>) project. There is a link directly to the CVAO website.

Minute data is submitted to the British Atmospheric Data Centre (BADC) on a monthly basis. For GAW submission (WDCGG), the data is averaged hourly, daily and monthly to an external time-step: - 00:00 to 01:00, 01/01/2007 00:00 to 02/01/2007 00:00, and 01/01/2007 00:00 to 01/02/2007 00:00.

The website is updated with current data at regular occasions.