

## Detailed Product Description

TEMIS columnar H<sub>2</sub>CO is made available in ascii files. There is one file per orbit. The files have the name of the LV1 files with the extension “\*.obs”. The files are formatted as followed:

### Data files format:

Comment lines:

Name	Description	exemple
TimeBegin TimeEnd	time of the first and the last pixel of the pixels included in the file	000257000556
orbit number	number of the satellite orbit	010574
number of pixels	number of ground pixels included in the file	0000912
Pressure Grid	Pressure grid of the Averaging Kernel (AK) and of the a-priori profile (aProf) [hPa – 60levels]	1010.02; ... ; 0.32

Columns :

Name	Description	Exemple
Col 1: Date	Date and time of the measurement (yymmddhhmmss)	20081102000320.1 56
Col 2: Lat1	Latitude of the first corner (degree)	0.5000
Col 3: Lat2	Latitude of the second corner (degree)	0.8700
Col 4: Lat3	Latitude of the third corner (degree)	1.0000
Col 5: Lat4	Latitude of the fourth corner (degree)	1.4000
Col 6: Latc	Latitude of the center of the pixel (degree)	0.9300
Col 7: Long1	Longitude of the first corner (degree)	140.0900
Col 8: Long2	Longitude of the second corner (degree)	140.1700
Col 9: Long3	Longitude of the third corner (degree)	137.8600
Col 10: Long4	Longitude of the fourth corner (degree)	137.9500
Col 11: Longc	Longitude of the center of the pixel (degree)	139.0200
Col 12: SCD_corr	Slant column density corrected with the reference sector method (the remote Pacific Ocean) (mol/cm <sup>2</sup> )	02.62e+15
Col 13: VCD	Vertical column density (mol/cm <sup>2</sup> )	04.53e+15
Col 14: Chi2	Chi square of the DOAS fit (no unit)	1.16e-06
Col 15: SZA	Solar zenith angle (degree)	38.99
Col 16: SAA	Solar azimuth angle (degree)	115.24
Col 17: LoSZA	Viewing zenith angle (degree)	24.84
Col 18: LoSAA	Viewing azimuth angle (degree)	102.65
Col 19: PT	Pixel Type	0
Col 20: CF	Cloud fraction (no unit)	0.06
Col 21: CT	Cloud top altitude (km)	8.38
Col 22: AMF	Air mass factor (no unit)	1.41
Col 23: SCDE_rand	SCD random error (mol/cm <sup>2</sup> )	8.47e+15
Col 24: SCDE_syst	SCD systematic error (mol/cm <sup>2</sup> )	4.95e+14
Col 25: AMFE	AMF error (no unit)	1.55e-01
Col 26: PacCorE	Pacific correction error (mol/cm <sup>2</sup> )	5.98e+14

Col 27-86: AK	Averaging kernel (no unit)	0.30 ... 1.69
Col 87-146: aProf	a-priori Profile (mol/cm <sup>3</sup> )	6.90e+09 ... 0

The total error can be calculated with the following expression:

$$VCDE^2 = \frac{1}{AMF^2} \cdot \frac{SCDE\_rand^2}{N} + \frac{1}{AMF^2} \cdot SCDE\_syst^2 + \left(\frac{SCD3}{AMF^2}\right)^2 \cdot AMFE^2 + PacCorE^2$$

Where  $N$  is the number of pixels taken to calculate the mean vertical column (1 if individual pixels are considered).