GOMOS Products Toolbox
User's manual

Issue 1.1

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Change Record

Issue	Date	Description	
is1r0	01/06/01	Issue 1 Revision 0	Initial version
is1r1	29/11/01	Issue 1 Revision 1	R8 option added to extract_pr

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1. Introduction

The purpose of this document is to describe how to use the *GOMOS products toolbox* in order to visualise/edit the GOMOS products. All GOMOS products may be processed (auxiliary products, processing output products including the level 2 meteo product).

The GOMOS products toolbox is a set a several programs dedicated to simple tasks: extracting data from a product in order to plot it, modifying a field in a product. These programs are:

- **gomtab**: extraction of data from a GOMOS level 0 product.
- **display_pr**: extraction of data from a GOMOS product (excluding a level 0 product).
- **info_pr**: returns the number of elements of a specified field of the product.
- **export_pr**: similar to display_pr except that the output format is compatible with the input format of modify_pr.
- **modify_pr**: allows to modify a product. Read an ASCII file generated by export_pr and store the data in a product. Note that the input data must be fully compatible with the product (same size of the field).
- **diff_pr**: comparison of two products.
- **header_pr**: write the header of a product on the standard output.
- **extract_pr**: extract the values of a variable written in a file generated by display_pr or export_pr.

In order to extract data from the GOMOS products, a specific data dictionary must be available in the working environment of the toolbox user. This data dictionary is specific to ACRI tools and is not compatible with the Envisat GOMOS DDT used by the Enviview tool for example.

The GOMOS products toolbox has been developed for Sun Unix platforms, system Solaris 2.6.

2. References

2.1 Reference documents

- RD1: PO-RS-MDA-GS-2009
  ENVISAT-1 Products specification
- RD2: PO-TN-MAT-GM-0223
  Instrument measurement Data Definition
- RD3: PO-RS-ACR-GS-0003
  GOMOS Input / Output Data Document

2.2 List of abbreviations and acronyms

ADC	Analogue-to-Digital Converter
ADU	Analogue-to-Digital Units
CNT	Crossing Nodal Time
FP	Fast Photometers
GOMOS	Global Ozone Monitoring by Occultation of Stars
ICU	Instrument Control Unit
IECF	Instrument Engineering Calibration Facility
I/O	Input / Output
IR	Infra-Red
JD	Julian Date
LSW	Least Significant Word
LSF	Spectral Line Spread Function
LUT	Look Up Table
MSW	Most Significant Word
NIR	Near Infra-Red
OBT	On Board Time
PPF	Polar PlatForm
PRNU	Pixel Response Non Uniformity
PSF	Spatial Line Spread Function
SDP	Source Data Packets
SFA	Steering Front Assembly
SP	Spectrometers A and B
SPA/B	Spectrometer A / Spectrometer B
SSM	Spatial Spread Monitoring
UTC	Coordinated Universal Time
UV	Ultra Violet
UVIS	Ultra violet - VISible

2.3 Definitions

Measurement	Time range corresponding to one GOMOS packet in Occultation or Linearity Monitoring mode or 11 packets in Spatial Spread Monitoring or Uniformity Monitoring modes.
Spectrometer sample	Spectrometer measurement made by the binning of several CCD lines in Occultation or Linearity Monitoring mode or by one single CCD pixel in Spatial Spread Monitoring or Uniformity Monitoring modes. One sample is provided for each transmitted CCD column.
Spectrum	Set of spectrometer samples measured by one CCD line or one spatial band during one measurement.

3. Installation of the GOMOS products toolbox

3.1 Installation

The GOMOS products toolbox distribution tar file must be copied in the installation directory (e.g. /usr/local/acri).

Using the tar -x command, the files contained in this tar file are extracted in /usr/local/acri/toolbox/gomos, /usr/local/acri/toolbox/gomos/demo (demo and script files), /usr/local/acri/toolbox/gomos/doc (user's manual in PDF format) and /usr/local/acri/toolbox/gomos/ index (the GOMOS data dictionary).

To simplify access to the GOMOS toolbox command, the directory /usr/local/acri/toolbox/gomos may be included in the user path.

A global variable (DATABASE_DIR) must be defined in order to indicate the path of the data dictionary to the toolbox commands (ksh and bash shells):

```
DATABASE_DIR=/usr/local/acri/toolbox/gomos/index
export $DATABASE_DIR
```

3.2 A simple test

When the installation is completed (files copied and environment variable created and exported), go in the demo directory and type:

```
../display_pr 1 level1b.prd 1201
```

and you must see the following lines as a result of this command:

```
-------------------------------------------------
-------------------------------------------------
--- TRA_OCCULTATION_DATA                      ---
-------------------------------------------------
-------------------------------------------------

$1201 Number of points of the spectra
450 966 420 500
```

If you don't see these lines, check the environment variable DATABASE_DIR and check also that the rights of the GOMOS toolbox commands allow their execution (rx rights for the user).

4. Description of the tools

4.1 gomtab

4.1.1 Description

This program allows to visualise the content of a GOMOS level 0 product. One integration at a time. The content of the data field header and of the data field header is also displayed and all codes are converted in *understandable* text.

4.1.2 Syntax

```
gomtab prd_name nrec
```

where:

- prd_name is the level 0 product filename,
- nrec is the occultation measurement number. The index of the first measurement is equal to 1. If nrec is negetive or equal to 0, the first measurement is displayed. If nrec is greater than the number of measurements of the selected occultation, then a warning message is displayed and the last measurement is displayed.

Note that in the first measurement of an occultation, the content of the Data Field Header is different of the content of the other measurements. The SATU data are replaced by instrument parameters such as band definition, thermistors temperature... The gomtab tool handles this specific configuration.

gomtab tool allows also to visualise the content of the level 0 product when the instrument is in monitoring mode. In this case, only one over the 11 records making one measurement is displayed at a time and nrec is no more the measurement number but the record number in the file (records 1 to 11 are for the first measurement, 12 to 22 are for the second measurement...).

The output of the gomtab command is written on the standard output device. Copy in a file or piping to another command is possible thanks to the standard Unix filter and pipe functions.

Warning: currently only level 0 with one occultation can be processed with gomtab

4.1.3 Examples

```
sh> gomtab level0.prd 6
```

```
  Values extracted from the MPH of the Level 0 product
```

```
UTC start time of data sensing ... : 20-JUN-1996 10:25:53.658651
UTC stop time of data sensing .... : 20-JUN-1996 10:26:28.158651

UTC of ENVISAT state vector ..... : 20-JUN-1996 10:06:52.269163
State vector (position) (m)..... :  -7162215.231 +0208912.061 -0000004.200
State vector (velocity) (m/s) .. :  +0056.067174 +1629.959976 +7377.420934
UTC corresponding to SBT time .... : 01-JUN-1996 00:00:00.000000
Reference SBT time ............... : +0000000000
Clock step (ps) .................. : +3906250000
DATA FIELD HEADER
ICU time code ................. = 0x199F342804EB  429863976.
Length of data field header ... =    256
Instrument mode ............... = Occultation
Redundancy definition vector .. =  10248
Instrument configuration ...... =   4863
Star identifier ............... =     40
Dark/Bright limb flag ......... = Dark limb
Data valid flag ............... = Successful
DMSA gain index ............... =      3     3
DMSB gain index ............... =      0     0
DM integration duration ....... =   0.50
Integration number ............ =      6
SATU measurements =
( 1581, 1440) ( 1581, 1440) ( 1467, 1443) ( 1475, 1501) ( 1436, 1385)
( 1496, 1464) ( 1445, 1483) ( 1455, 1475) ( 1446, 1387) ( 1483, 1390)
( 1374, 1512) ( 1431, 1429) ( 1454, 1530) ( 1450, 1548) ( 1450, 1414)
( 1516, 1463) ( 1385, 1479) ( 1495, 1443) ( 1454, 1412) ( 1466, 1486)
( 1465, 1511) ( 1449, 1421) ( 1485, 1432) ( 1445, 1450) ( 1408, 1400)
( 1482, 1495) ( 1482, 1495) ( 1440, 1493) ( 1462, 1483) ( 1513, 1513)
( 1461, 1380) ( 1463, 1484) ( 1498, 1494) ( 1414, 1512) ( 1416, 1368)
( 1524, 1447) ( 1508, 1401) ( 1414, 1456) ( 1466, 1481) ( 1446, 1486)
( 1444, 1510) ( 1429, 1487) ( 1445, 1490) ( 1457, 1413) ( 1494, 1462)
( 1512, 1453) ( 1412, 1513) ( 1524, 1469) ( 1433, 1379) ( 1529, 1518)
SFA measurements =
    6  2350  6206
    6  2352  6199
    6  2354  6193
    6  2356  6186
    6  2358  6179
PACKET NUMBER      6
ANNOTATIONS
ISP sensing time .............. =        -1290       37556      158651
GS reference time ............. =          450       39800           0
PACKET HEADER
Packet version number ......... =      4
Packet type ................... =      0
Data field header flag ........ =      1
```

```
 Application process ID ........ = 0x0480
 Segmentation flag ............. =      3
 Source sequence count ......... =      5
 Packet length ................. =  12288

 Spectrometer A - CCD 1 - Id =  1040 - samples

                                U     C     L
 SPA CCD1 : column    1 :     142   413   143
 SPA CCD1 : column    2 :     141   413   143
 SPA CCD1 : column    3 :     141   424   146
 SPA CCD1 : column    4 :     141   425   144
 SPA CCD1 : column    5 :     140   425   144
< lines deleted>
 SPA CCD1 : column  446 :     146   143   145
 SPA CCD1 : column  447 :     144   144   144
 SPA CCD1 : column  448 :     144   146   145
 SPA CCD1 : column  449 :     145   147   144
 SPA CCD1 : column  450 :     145   143   144

 Spectrometer A - CCD 2 - Id =  3120 - samples

                                U     C     L
 SPA CCD2 : column    1 :     138   300   140
 SPA CCD2 : column    2 :     137   302   140
 SPA CCD2 : column    3 :     138   303   138
 SPA CCD2 : column    4 :     135   303   139
 SPA CCD2 : column    5 :     136   302   139
< lines deleted>
 SPA CCD2 : column  962 :     137   137   138
 SPA CCD2 : column  963 :     137   139   141
 SPA CCD2 : column  964 :     139   138   139
 SPA CCD2 : column  965 :     137   140   139
 SPA CCD2 : column  966 :     139   136   138

 Spectrometer B - CCD 1 - Id =  1560 - samples

                                U     C     L
 SPB CCD1 : column    1 :     124   226   125
 SPB CCD1 : column    2 :     127   225   125
 SPB CCD1 : column    3 :     125   223   126
 SPB CCD1 : column    4 :     126   227   127
 SPB CCD1 : column    5 :     124   227   125
< lines deleted>
 SPB CCD1 : column  416 :     126   218   126
 SPB CCD1 : column  417 :     127   220   128
 SPB CCD1 : column  418 :     129   217   127
 SPB CCD1 : column  419 :     127   219   131
 SPB CCD1 : column  420 :     127   219   127

 Spectrometer B - CCD 2 - Id =  3640 - samples

                                U     C     L
 SPB CCD2 : column    1 :     136   170   138
 SPB CCD2 : column    2 :     137   169   139
 SPB CCD2 : column    3 :     138   167   138
 SPB CCD2 : column    4 :     136   168   139
 SPB CCD2 : column    5 :     136   168   138
< lines deleted>
```

```
  SPB CCD2 : column  496 :    134   165   136
  SPB CCD2 : column  497 :    138   162   138
  SPB CCD2 : column  498 :    137   168   135
  SPB CCD2 : column  499 :    135   160   137
  SPB CCD2 : column  500 :    136   167   137

  Fast photometer 1 measurements - Id =  520

   824   823   822   824   823   827   822   826   824   823
   823   823   823   822   825   824   826   823   822   823
   823   821   823   822   823   824   823   825   826   823
< lines deleted>
   823   824   823   822   822   822   821   824   826   820
   823   822   823   822   823   824   823   824   822   825
   823   824   824   820   822   825   821   823   823   823

  Fast photometer 2 measurements - Id =  2600

   802   803   806   803   801   802   801   800   799   805
   803   803   802   800   803   805   804   803   801   804
   803   801   800   801   804   800   801   803   805   800
< lines deleted>
   802   805   801   802   802   798   803   803   801   802
   799   801   803   804   802   802   802   801   802   802
   801   802   803   803   804   801   803   801   803   802
```

sh> gomtab level0.prd 1

```
  Values extracted from the MPH of the Level 0 product

  UTC start time of data sensing ... : 20-JUN-1996 10:25:53.658651
  UTC stop time of data sensing .... : 20-JUN-1996 10:26:28.158651

  UTC of ENVISAT state vector ...... : 20-JUN-1996 10:06:52.269163
  State vector (position) (m) .... :  -7162215.231 +0208912.061 -0000004.200
  State vector (velocity) (m/s) .. :  +0056.067174 +1629.959976 +7377.420934

  UTC corresponding to SBT time .... : 01-JUN-1996 00:00:00.000000
  Reference SBT time ............... : +0000000000
  Clock step (ps) .................. : +3906250000

  DATA FIELD HEADER

  ICU time code ................. = 0x199F31A804EB  429863336.
  Length of data field header ... =    256
  Instrument mode ............... = Occultation
  Redundancy definition vector .. =  10248
  Instrument configuration ...... =   4863
  Star identifier ............... =     40
  Dark/Bright limb flag ......... = Dark limb
  Data valid flag ............... = Successful
  DMSA gain index ............... =      3     3
  DMSB gain index ............... =      0     0
  DM integration duration ....... =   0.50
  Integration number ............ =      1
```

```
Spectrometer A parameters =

CCD 1 start column ........... =    450
CCD 1 column width ........... =    450
CCD 1 start line ............. =     69
CCD 1 background band width .. =      7
CCD 1 isolation band width ... =      2
CCD 1 target band width ...... =      7
CCD 1 thermistor code ........ =   161.

CCD 2 start column ........... =    140
CCD 2 column width ........... =    966
CCD 2 start line ............. =     68
CCD 2 background band width .. =      7
CCD 2 isolation band width ... =      2
CCD 2 target band width ...... =      7
CCD 2 thermistor code ........ =   161.

Spectrometer B parameters =

CCD 1 start column ........... =    515
CCD 1 column width ........... =    420
CCD 1 start line ............. =     71
CCD 1 background band width .. =      7
CCD 1 isolation band width ... =      2
CCD 1 target band width ...... =      7
CCD 1 thermistor code ........ =   161.

CCD 2 start column ........... =    455
CCD 2 column width ........... =    500
CCD 2 start line ............. =     72
CCD 2 background band width .. =      7
CCD 2 isolation band width ... =      2
CCD 2 target band width ...... =      7
CCD 2 thermistor code ........ =   161.

Fast photometers parameters =

FP1 start column ............. =      7
FP2 start column ............. =      5

FP1 thermistor code .......... =   161.
FP2 thermistor code .......... =   161.

SFA measurements =
    6  2302  6376
    6  2304  6369
    6  2306  6362
    6  2308  6356
    6  2309  6349

PACKET NUMBER      1

ANNOTATIONS

ISP sensing time .............. =        -1290       37553      658651
GS reference time ............. =          450       39800           0
```

```
PACKET HEADER

Packet version number ......... =      4
Packet type ................... =      0
Data field header flag ........ =      1
Application process ID ........ = 0x0480
Segmentation flag ............. =      3
Source sequence count ......... =      0
Packet length ................. =  12288

Spectrometer A - CCD 1 - Id =  1040 - samples

                                U     C     L
SPA CCD1 : column    1 :    143   421   142
SPA CCD1 : column    2 :    142   417   144
SPA CCD1 : column    3 :    143   421   146
SPA CCD1 : column    4 :    142   420   146
SPA CCD1 : column    5 :    140   423   145

< lines deleted>
```

4.2 display_pr

4.2.1 Description

This program allows to visualise the content of GOMOS products. Any binary field can be extracted. MPH and SPH contents can be visualised by using the header_pr tool.

4.2.2 Syntax

```
display_pr prd_type prd_name [code]... [code]
```

where:

- prd_type is the type of the product (see appendix A)
- prd_name is the product filename,
- code is the GOPR data dictionary code of the selected field (e.g. 6403) (see appendix B). If no code is specified, then all field of the product are displayed. Wildcarding is allowed: if only the first digits are specified then all fields starting with these digits are displayed (e.g. 64).

The output of the display_pr command is written on the standard output device. Copy in a file or piping to another command is possible thanks to the standard Unix filter and pipe functions.

If several codes are specified, all corresponding fields are displayed.

If the selected fields belong to an ADS or a MDS, all occurrences of these fields in the product are displayed.

Important: there is no check of coherency between the specified and actual type of the product. Giving a wrong type may lead to unpredictable displays. Generally, there will be just no display. There is also no check concerning the coherency of the specified codes. If a code does not exist or belong to another type of product, there will be simply no output.

4.2.3 Examples

sh> display_pr 1 level1b.prd 1216 1217 1204

```
-------------------------------------------------
-------------------------------------------------
--- TRA_OCCULTATION_DATA                      ---
-------------------------------------------------
-------------------------------------------------

$1204 Photometers central wavelength
499.5 672.0

$1216 Thermistor temperature (SP)
283.15 283.15 283.15 283.15

$1217 Thermistor temperature (FP)
283.15 283.15
```

Note: all three fields are displayed. The order is always the order of the product, not the order on the command line. They belong to a GADS, so only one occurrence is displayed.

sh> display_pr 1 level1b.prd 14

```
-------------------------------------------------
-------------------------------------------------
--- TRA_REF_STAR_SPECTRUM                     ---
-------------------------------------------------
-------------------------------------------------


$1401 Number of star spectra used for the computation of the reference star
spectrum
4

$1402 Reference star spectrum
9848.51 9883.01 9849.12 10019.09 9910.43
9972.83 9955.33 10099.79 10051.24 10176.33
10131.75 10169.22 10150.75 10289.81 10200.50
10280.20 10235.39 10286.46 10189.89 10277.73
10426.03 10376.18 10493.97 10224.65 10437.98
 < lines deleted>

$1403 Spare
```

Note: all fields of the GADS (#14 is TRA_REF_STAR_SPECTRUM) are displayed.

sh> display_pr 1 level1b.prd 1301 1602

```
-------------------------------------------------
-------------------------------------------------
--- TRA_NOM_WAV_ASSIGNMENT                    ---
-------------------------------------------------
-------------------------------------------------


$1301 Nominal wavelength assignment
245.709394 246.023894 246.338394 246.652894 246.967394
247.281894 247.596394 247.910894 248.225394 248.539894
248.854394 249.168894 249.483394 249.797894 250.112394
 < lines deleted>
953.068246 953.125246 953.182246 953.239246 953.296246
953.353246 953.410246 953.467246 953.524246 953.581246
953.638246


-------------------------------------------------
-------------------------------------------------
--- TRA_TRANSMISSION                          ---
-------------------------------------------------
-------------------------------------------------


$1602 Full transmission spectra
0
1.00885391 1.005355 1.00969815 1.00385869 0.989172578
1.00806379 0.98828882 0.997564077 0.989185154 1.0009743
1.01129711 1.01298046 1.00662816 0.978936851 1.00753355
 < lines deleted>
0.842401385 1.09607661 0.957773924 1.04987979 1.06615472
1.04740655 0.920123518 0.941987813 0.973694801 0.9497118
0.887187719

$1602 Full transmission spectra
1
0.994648814 1.01245213 1.00269818 1.00721323 1.02812803
1.00468791 1.03048408 0.990822315 1.01706064 0.990764201
1.00776386 0.975177586 0.996154308 0.992493391 0.997276366
 < lines deleted>
0.877231479 1.05990481 0.921909511 0.970220327 1.06540036
1.0081979 0.955224156 1.01939571 1.00903714 0.988685787
0.990798891

$1602 Full transmission spectra
69
-0.000895923935 -0.00799373444 -0.00348939863 0.000684695842 -8.00265625e-05
0.007254784 -0.000118778189 -0.00451970659 0.00322646438 -0.000581754895
-0.0015194274 0.000425177859 -0.0008330454 0.00551505154 0.00493374513
 < lines deleted>
0.183226734 0.13054505 0.157811627 0.127541065 0.183798462
```

```
0.180342302 0.211793453 0.197004601 0.216789231 0.181588352
0.226979524
```

Note: field 1602 of the GADS is displayed only once while all occurrences of the transmission spectra are extracted automatically. Note that the title of each data set type is displayed before the data.

Note: in case of field extracted from a MDS or and ADS, the index of the ADSR or of the MDSR is written before the data. The first index starts at 0.

4.3 info_pr

4.3.1 Description

This program retruns the size of a specified field in a specified product. It may be used before calling extract_pr when the user does not know the number of elements of the variable he wants to extract from the product (this information is needed by extract_pr).

4.3.2 Syntax

```
info_pr prd_type prd_name code
```

where:

- prd_type is the type of the product (see appendix A)
- prd_name is the product filename,
- code is the GOPR data dictionary code of the selected field (e.g. 6403) (see appendix B). Only one code must be on the command line.

The output of the info_pr command is written on the standard output device. Copy in a file or piping to another command is possible thanks to the standard Unix filter and pipe functions. The usual way of using the command is to store the output in a global variable which may be used further by another command such as extract_pr (see examples in annex C).

4.3.3 Examples

```
sh> info_pr 1 level1b.prd 1216
4

sh> info_pr 1 level1b.prd 1302
64

sh> info_pr 4 res_ext.prd 4302
2336
```

4.4 export_pr

4.4.1 Description

This program is similar to the display_pr program. The only difference is the format of the output data. export_pr output format is compatible with the input format of the modify_pr command. The file created by the export_pr command may be edited and used directly by the modify_pr command.

4.4.2 Syntax

```
export_pr prd_type prd_name ascii_file [code]... [code]
```

where:

- prd_type is the type of the product (see appendix A)
- prd_name is the product filename,
- ascii_file is the name of the file which will contain the displayed variables,
- code is the GOPR data dictionary code of the selected field (e.g. 6403) (see appendix B). If no code is specified, then all field of the product are displayed. Wildcarding is allowed: if only the first digits are specified then all fields starting with these digits are displayed (e.g. 64).

The output of the export_pr command is written in the ascii file specified on the command line.

If several codes are specified, all corresponding fields are displayed.

If the selected fields belong to an ADS or a MDS, all occurrences of these fields in the product are displayed.

Important: there is no check of coherency between the specified and actual type of the product. Giving a wrong type may lead to unpredictable displays. Generally, there will be just no display. There is also no check concerning the coherency of the specified codes. If a code does not exist or belong to another type of product, there will be simply no output.

4.4.3 Examples

```
sh> export_pr 1 level1b.prd ficout 1216 1217 1204
sh> cat ficout
$1204 Photometers central wavelength nbElem 2 Storage 20
499.5 672.0
$1216 Thermistor temperature (SP) nbElem 4 Storage 20
283.15 283.15 283.15 283.15
$1217 Thermistor temperature (FP) nbElem 2 Storage 20
283.15 283.15
```

4.5 modify_pr

4.5.1 Description

This program allows to change the values of the data in any GOMOS product (except the level 0 product). The new values are specified in an ASCII file under a specific format (compatible with the output format of the export_pr command).

4.5.2 Syntax

```
modify_pr ascii_file prd_name prd_type
```

where:

- ascii_file is the name of the file which will contain the new data values,
- prd_name is the product filename,
- prd_type is the type of the product (see appendix A).

The output of the modify_pr command is the new product. There is no other output generated.

All data found in the ASCII file updates the existing values of the product.

If the selected fields belong to an ADS or a MDS, only the specified occurrences will be modified.

Important: there is no check of coherency between the specified and actual type of the product. Giving a wrong type may lead to unpredictable results. Generally, there will be just no impact on the product. There is also no check concerning the coherency of the specified codes. If a code does not exist or belong to another type of product, there will be simply no modification of the product.

Warning: in the case of an ADS or an MDS, if the specified record number is greater than the actual number of records, then the new data will overwrite some part of the product.

New values of several variables may be specified in a single ASCII file. The format is the following: first line is the variable code (starting with the $ sign) - *only the code is required*, then the new values are written on the following line(s).

The best way to modify a product with a minimum of risk is to use the export_pr command to generate a template to be edited with the new values of the variables. Then, the modified template may be used to update the product (see the example below).

4.5.3 Examples

```
sh> export_pr 1 level1b.prd ficout 1216
sh> cat ficout
$1216 Thermistor temperature (SP) nbElem 4 Storage 20
283.15 283.15 283.15 283.15
```

sh> xemacs ficout

Note: ficout file is manually edited and existing values are replaced by: `293.10 293.11 293.12 293.13`

sh> cp level1b.prd new.prd

Note: copy level1B.prd product into new.prd to avoid modifying the original file...

sh> modify_pr ficout new.prd 1

Note: modify the new.prd product with the new values of the thermistor temperature.

sh> export_pr 1 zzz.prd ficout2 1216

sh> cat ficout2

```
$1216 Thermistor temperature (SP) nbElem 4 Storage 20
293.10 293.11 293.12 293.13
```

4.6 diff_pr

4.6.1 Description

This program allows to compare two products.

4.6.2 Syntax

```
diff_pr prd_type prd_name_1 prd_name_2
```

where:

- prd_type is the type of the product (see appendix A),
- prd_name_1 and prd_name_2 are is the product filenames.

The output of the diff_pr command is written on the standard output. Only the codes of the fields found as different are displayed. The display_pr command must be used on both products to see the actual differences.

The MPH and SPH are also compared. When a byte is different in these records, the byte location is displayed as well as the byte value in both products.

If the selected fields belong to an ADS or a MDS, only the occurrences showing differences are displayed.

If no output is displayed, it means that the two files are identical (this can be checked by using the diff Unix command).

Using diff_pr command after a modify_pr command is a safe way to verify if the requested modifications have been applied and that no other field has been modified in the product.

4.6.3 Examples

```
sh> diff_pr 1 zzz.prd level1b.prd
$1216 (Thermistor temperature (SP))
```

Note: zzz.prd is the product generated during the example described for the modify_pr command.

4.7 header_pr

4.7.1 Description

This program allows to display the ASCII header (MPH+SPH) of the GOMOS products.

4.7.2 Syntax

```
header_pr prd_name prd_type
```

where:

- prd_name is the product filename,
- prd_type is the type of the product (see appendix A).

The output of the header_pr command is written on the standard output.

4.7.3 Examples

```
sh> header_pr lv1b_conf.prd 7
PRODUCT="GOM_PR1_AXSACR19991013_180000_19991013_100000_20100101_000000 "
PROC_STAGE=S
<lines deleted>
PRODUCT_ERR=0
TOT_SIZE=+00000000000000002351<bytes>
SPH_SIZE=+0000000658<bytes>
NUM_DSD=+0000000002
DSD_SIZE=+0000000280<bytes>
NUM_DATA_SETS=+0000000002
<lines deleted>
SPH_DESCRIPTOR="LEVEL1B_PROCESSING_CONF_V5.1"

DS_NAME="PR1_GENERAL                  "
DS_TYPE=G
FILENAME="                                                                    "
DS_OFFSET=+00000000000000001905<bytes>
DS_SIZE=+00000000000000000226<bytes>
NUM_DSR=+0000000001
DSR_SIZE=+0000000226<bytes>

DS_NAME="PR1_ATMOSPHERE               "
DS_TYPE=G
FILENAME="                                                                    "
```

```
DS_OFFSET=+0000000000000002131<bytes>
DS_SIZE=+0000000000000000220<bytes>
NUM_DSR=+0000000001
DSR_SIZE=+0000000220<bytes>
```

4.8 extract_pr

4.8.1 Description

This program allows to extract specified data from a file created by a display_pr or a export_pr command.

4.8.2 Syntax

```
extract_pr ficin code nval INT|REAL|R8|MJD MDS|GADS [f0] [k0]
```

where:

- ficin is the name of the ASCII file (output of display_pr or export_pr command),
- code is the GOPR data dictionary code of the selected field (e.g. 6403) (see appendix B). If no code is specified, then all field of the product are displayed. Wildcarding is allowed: if only the first digits are specified then all fields starting with these digits are displayed (e.g. 64).
- nval is the number of values in the field (see info_pr command).
- INT|REAL|R8|MJD is the field type (integer, real or julian date). In case of a julian date, the three integers making the UTC in transport format are converted in floating point representation. R8 is used for double precision floating point data.
- MDS|GADS: MDS must be specified if the variable belongs to an ADS or to a MDS. In this case, all occurrences of the variable in the product are displayed. GADS must be specified if the variable belongs to a GADS. Specification of a wrong information will lead to a bad interpretation of the input file.
- f0 is a record number. In case of a MDS variable, only the variable value contained in the record number f0 will be displayed. If f0 is missing or set to -1, all occurrences of the variable are displayed. In case of a GADS, this parameter is ignored. First record index is 0.
- k0 is an index of a vector location. If the extracted variable is a vector and if k0 is specified, only element k0 of this vector is displayed. If k0 is not specified, all vector is displayed.

The output of the extract_pr command is written on the standard output.

Outputs of several extract_pr commands can be combined using Unix commands or filters to build plot files (see the examples below and in annex C).

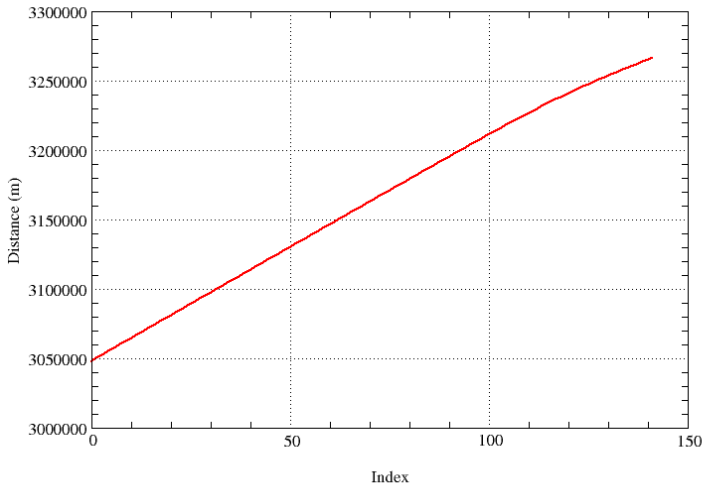
Combinaisons of display_pr, extract_pr and Unix commands in Unix shells allow to build any kind of data files useful for data interpretation, data plotting or input to further processing.

Note: to avoid multiple calls to display_pr, a global command may be applied to the product. Anyway, any further commands such as extract_pr will take more time to execute because the input file is bigger and browsing it will be longer.

4.8.3 Examples

A simple plot (distance between satellite and tangent point, code 190B):

```
sh> display_pr 1 level1b.prd 190B > zzz.dat
sh> extract_pr zzz.dat 190B 2 REAL MDS -1 > plot.dat
sh> more plot.dat
     3048192.0000000
     3049836.7000000
     3051486.9000000
<lines deleted>
sh> xmgrace plot.dat
```



Another simple plot (transmission versus wavelength, code 1602 and 1301):

```
sh> display_pr 1 level1b.prd 1301 1602 > zzz.dat
```

NVAL will contain the number of elements of field 1301 (spectrum size...ie 2336 elements... just to show how to use it!)

```
sh> NVAL=`info_pr 1 level1b.prd 1301`
```

wl.dat will contain the nominal wavelengths extracted from the zzz.dat file

```
sh> extract_pr zzz.dat 1301 $NVAL REAL GADS > wl.dat
```

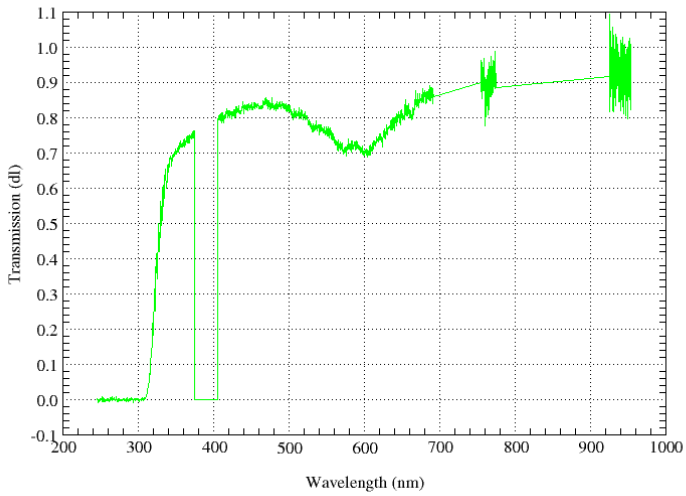
trans.dat will contain the transmission of the 51-th measurement extracted from the zzz.dat file.

```
sh> extract_pr zzz.dat 1602 $NVAL REAL MDS 50 > trans.dat
```

now join columns of both files to build a single plot file.

```
sh> paste wl.dat trans.dat > plot.dat
sh> cat plot.dat
     245.70939400000         2.7137466200000D-03
     246.02389400000        -7.6965498700000D-03
```

```
     246.33839400000        -7.1519687800000D-03
<lines deleted>
```
sh> xmgrace plot.dat



Do you need the TGP altitude corresponding to this measurement (code 1907) ?

sh> display_pr 1 level1b.prd 1907 > zzz.dat
sh> extract_pr zzz.dat 1907 1 REAL MDS 50
```
     36413.900000000
     35651.760000000
```
So, around 35.6 km
Note: there are two values (one at the beginning of the measurement and one at half-measurement.

A last plot (transmission versus time for CCD column number 1000, code 1602 and 1600):

sh> display_pr 1 level1b.prd 1600 1602 > zzz.dat
time.dat will contain the MJS of each measurement extracted from the zzz.dat file
sh> extract_pr zzz.dat 1600 1 MJD MDS > time.dat
sh> more time.dat
```
    -1289.5653511730
    -1289.5653453860
    -1289.5653395989
    -1289.5653338119
<lines deleted>
```
Date is in day... make it relative to the start of the occultation and convert in seconds...
sh> MJD0=`head -1 time.dat`
sh> echo $MJD0
```
    -1289.5653511730
```
sh> awk '{print ($1-$MJD0)*86400.}' < time.dat > time2.dat
Obviously, we got the expected GOMOS measurement frequency (2 hz)
sh> cat time2.dat
```
0
0.499997
1
```

```
1.5
2
<lines deleted>
```

Extract column 1000 of each transmission spectrum (specifies f0 to -1 and k0 index = 1000).

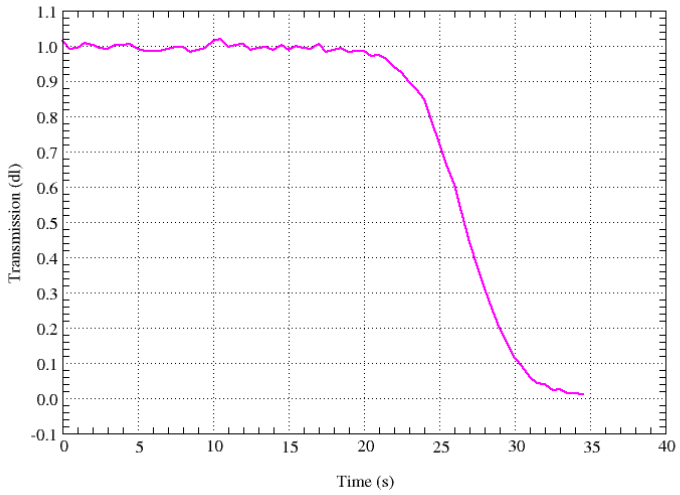
```
sh> extract_pr zzz.dat 1602 $NVAL REAL MDS -1 1000 > trans.dat
```

70 lines in the trans.dat file, one per measurement.

```
sh> more trans.dat
     1.0140771900000
    0.99149596700000
    0.99377280500000
<lines deleted>
     1.5143523900000D-02
     1.3012833000000D-02
     1.0628828800000D-02
```

now join columns of both files to build a single plot file.

```
sh> paste time2.dat trans.dat > plot.dat
sh> xmgrace plot.dat
```



Do you need the wavelength assignment of this CCD column (code 1301) ?

```
sh> display_pr 1 level1b.prd 1301 > zzz.dat
sh> extract_pr zzz.dat 1301 2336 REAL GADS -1 1000
    562.18791400000
```

5. Quick reference

gomtab	Extract the data from a GOMOS level 0 product
	gomtab prd_name [nrec] prd_name is the level 0 product filename nrec is the occultation measurement number <output on the standard output device> Note: today only level 0 with only one occultation can be processed with gomtab.
display_pr	Extract the data from a product
	display_pr prd_type prd_name [code] prd_type is the type of the product prd_name is the product filename code is the GOPR data dictionary code (like 6403). If not specified, then all the product is displayed <output on the standard output device>
info_pr	Returns the size of a product field
	info_pr prd_type prd_name code prd_type is the type of the product prd_name is the product filename code is the GOPR data dictionary code (like 6403). <output on the standard output device>
export_pr	Similar to display_pr except that the output format is compatible with the input format of modify_pr
	export_pr prd_type prd_name ascii_name [code] prd_type is the type of the product prd_name is the product filename ascii_name is the name of the output file (ASCII format) code is the GOPR data dictionary code (like 6403). If not specified, then all the product is exported <output in the ascii_name file>
modify_pr	Allows to modify a product. Read an ASCII file generated by export_pr and store the data in a product. Note that the input data must be fully compatible with the product (same size of the data)
	modify_pr ascii_name prd_name prd_type ascii_name is the name of the input file (ASCII format) prd_name is the product filename prd_type is the type of the product <no output - prd_name file is modified>
diff_pr	Comparison of two products
	diff_pr prd_type prd_name1 prd_name2 prd_type is the type of the product prd_name1 is the first product filename prd_name2 is the second product filename <output on the standard output device>
header_pr	Write the header of a product on the standard output
	header_pr prd_name prd_type prd_name is the product filename prd_type is the type of the product <output on the standard output device>

extract_pr	Extract the values of a variable written in a file generated by display_pr or export_pr
	extract_pr file code nval INT|REAL|R8|MJD MDS|GADS [f0] [k0] file is a file created by a display_pr or export_pr command code is the GOPR data dictionary code (like 6403) nval is number of values to be read by record INT|REAL|R8|MJD specifies if the data type is integer, real or date MDS|GADS is the type of the record to be read (if this is a GADS, only one value must be read (and there is no additional value after the variable description in the input file). f0: if the type is a MDS, and if f0 is specified, then extract only the record number f0 (this is useful to extract only one MDS record like for the transmission). All MDSR by default when f0 is not specified or set to -1 k0: only element k0 of the extracted vector is displayed. All vector is displayed if k0 is not specified. <output on the standard output device>

6. Appendix A - Products type

The following table lists the type of each GOMOS product. These values have to be specified to the GOMOS product toolbox programs (display_pr, info_pr, export_pr, modify_pr...).

Type	Product
0	level 0
1	level 1b
2	limb
3	level 2
4	residual extinction
5	instrument physical characteristics
6	calibration
7	level 1b processing configuration
8	star catalogue
9	stellar spectra databank
B	level 2 processing configuration
C	cross-section database
F	level 2 meteo

7. Appendix B - Variable codes

The code of the variables of each GOMOS products are provided in the following chapter. Each line of the tables corresponds to one product field. The first column is the variable code (starting with a dummy $ symbol), the second column is the variable description (identical to the one of the GOMOS IODD), the third one is the scaling factor (note that the scaling factor is always applied when the variable is extracted from the product by any of the GOMOS product toolbox programs), the fourth one is the variable unit, next one is the storage type, three last ones are the dimensions of the variable as it is stored in the file.

Note concerning the variable dimension: the values N1, N2 and N3 may be understood as if the variable was declared as $X[N_3][N_2][N_1]$ in a C program or $X(N_1,N_2,N_3)$ in a Fortran program. Anyway, the values extracted from the product whatever the (N_1,N_2,N_3) parameters are always under the form of a mono-dimensional vector of size $N_1*N_2*N_3$. The correspondence between the multi- and mono- dimensional arrays is obtained by the formulas:

$$X_{mono}\left(n_1+\left(n_2-1\right)\cdot N_1+\left(n_3-1\right)\cdot N_1\cdot N_2\right)=X_{multi}\left(n_1,n_2,n_3\right) \text{ in Fortran}$$

$$X_{mono}\left[n_1+n_2\cdot N_1+n_3\cdot N_1\cdot N_2\right]=X_{multi}\left[n_3\right]\left[n_2\right]\left[n_1\right] \text{ in C}$$

7.1 Level 1b product

Id	Description	Scale	Unit	St	N1	N2	N3
$1201	Number of points of the spectra		dl	us	4	0	0
$1202	Number of photometer output data per measurement		dl	us	1	0	0
$1203	Number of SATU output data per measurement		dl	us	1	0	0
$1204	Photometers central wavelength	1.E-01	nm	us	2	0	0
$1205	Time shift for ray tracing / geolocation	1.E-03	s	us	1	0	0
$1206	Ref. wavelength for the ray tracing	1.E-01	nm	us	1	0	0
$1207	SATU data coding offset	1.E-09	rad	sl	1	0	0
$1208	SATU data coding gain	1.E-09	rad/ADU	ul	1	0	0
$1209	Offset for the SFA azimuth conversion	1.E-06	deg	sl	1	0	0
$120A	Relative offset for the SFA azimuth conversion	1.E-06	deg	sl	1	0	0
$120B	Factor for SFA azimuth conversion (LSW)	1.E-09	deg/ADU	ul	1	0	0
$120C	Factor for SFA azimuth conversion (MSW)	1.E-06	deg/ADU	ul	1	0	0
$120D	Offset for the SFA elevation conversion	1.E-06	deg	sl	1	0	0
$120E	Relative offset for the SFA elevation conversion	1.E-06	deg	sl	1	0	0
$120F	Factor for SFA elevation conversion (LSW)	1.E-09	deg/ADU	ul	1	0	0
$1210	Size of the calibration gain curve (background)		dl	uc	1	0	0
$1211	Abscissae of the calibration gain curve (background)	1.E-03	nm	ul	32	0	0
$1212	Calibration gain curve (background)		lf per e	fl	32	0	0
$1213	Size of the calibration gain curve (star)		dl	uc	1	0	0
$1214	Abscissae of the calibration gain curve (star)	1.E-03	nm	ul	32	0	0
$1215	Calibration gain curve (star)		sf per e	fl	32	0	0
$1216	Thermistor temperature (SP)	1.E-02	K	us	4	0	0
$1217	Thermistor temperature (FP)	1.E-02	K	us	2	0	0
$1218	Offset between thermistor and CCD arrays temperature	1.E-02	K	us	6	0	0
$121A	Spare		-	uc	28	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1301	Nominal wavelength assignment	1.E-06	nm	ul	2336	0	0
$1302	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1401	Number of star spectra used for the computation of the refer		dl	uc	1	0	0
$1402	Reference star spectrum	1.E-02	e	sl	2336	0	0
$1403	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1501	Size of the reference atmospheric profile		dl	uc	1	0	0
$1502	First altitude of the profile	1.E-01	m	ul	1	0	0
$1503	Altitude discretisation	1.E-01	m	ul	1	0	0
$1504	Reference atmospheric density profile		cm-3	fl	101	0	0
$1505	Spare		-	uc	6	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1600	Start time of the Data Set Record		mjd	mjd	3	0	0
$1601	Data quality indicator		-	sc	1	0	0
$1602	Full transmission spectra		dl	fl	2336	0	0
$1603	Covariance function of the full transmission		dl	fl	2336	0	0
$1604	Scaled estimated central background		e	us	2336	0	0
$1605	Error bar for the estimated central background	1.E-01	%	us	2336	0	0
$1606	Photometers engineering data (FP1)		e	fl	500	0	0
$1607	Photometers engineering data (FP2)		e	fl	500	0	0
$1608	Error bar for the photometers eng. data (FP1)	1.E-01	%	us	50	0	0
$1609	Error bar for the photometers eng. data (FP2)	1.E-01	%	us	50	0	0
$160A	PCD at sample level (SP)		dl	us	2336	0	0
$160B	PCD at sample level (FP)		dl	us	2	0	0
$160C	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1700	Start time of the Data Set Record		mjd	mjd	3	0	0
$1701	Data quality indicator		-	sc	1	0	0
$1702	SATU output data (X direction)		ADU	us	50	0	0
$1703	SATU output data (Y direction)		ADU	us	50	0	0
$1704	SFA angles measurements		ADU	us	5	3	0
$1705	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1800	Start time of the measurement		mjd	mjd	3	0	0
$1801	Attachment flag		dl	uc	1	0	0
$1802	Wavelength assignment of the spectra	1.E-04	nm	ss	2336	0	0
$1803	Offset for the estimated background coding		e	fl	1	0	0
$1804	Gain for the estimated background coding		dl	fl	1	0	0
$1807	Mean dark charge for the spectrometers (3 bands)		e	fl	4	3	0
$1808	Mean dark charge for the photometers		e	fl	2	0	0
$1809	PCD at measurement level		dl	us	16	0	0
$180A	Spare		-	uc	32	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1900	Start time of the DSR		mjd	mjd	3	0	0
$1901	Attachment flag		dl	uc	1	0	0
$1903	Latitude of the spacecraft (*)	1.E-06	deg	sl	2	1	0
$1902	Longitude of the spacecraft (*)	1.E-06	deg	sl	2	1	0
$1904	Altitude of the spacecraft (*)	1.E-02	m	ul	2	1	0
$1906	Latitude of the tangent point (*)	1.E-06	deg	sl	2	1	0
$1905	Longitude of the tangent point (*)	1.E-06	deg	sl	2	1	0
$1907	Altitude of the tangent point (*)	1.E-02	m	ul	2	1	0
$1909	Error on the latitude of the tangent point (*)	1.E-07	deg	sl	2	1	0
$1908	Error on the longitude of the tangent point (*)	1.E-07	deg	sl	2	1	0
$190A	Error on the altitude of the tangent point (*)	1.E-03	m	ul	2	1	0
$190B	Distance spacecraft - tangent point (*)	1.E-01	m	ul	2	1	0
$190C	Instrument pointing direction (azimuth) (**)	1.E-06	deg	sl	1	0	0
$190D	Instrument pointing direction (elevation) (**)	1.E-06	deg	sl	1	0	0
$190E	Virtual star direction in the quasi-true of date frame		dl	fl	2	3	0
$190F	Number of nodes of the ray tracing (**)		dl	us	1	0	0
$1910	Index of the tangent point in the list of the ray tracing no		dl	us	1	0	0
$1911	Interpolation factor P for the law delta(lambda) (*)		deg	fl	2	1	0
$1912	Interpolation factor Q for the law delta(lambda) (*)		deg	fl	2	1	0
$1913	Interpolation factors P for the law h0(lambda) (*)		m	fl	2	1	0
$1914	Interpolation factors Q for the law h0(lambda) (*)		m	fl	2	1	0
$1916	Latitude of the ray tracing grid nodes (**)	1.E-06	deg	sl	150	0	0
$1915	Longitude of the ray tracing grid nodes (**)	1.E-06	deg	sl	150	0	0
$1917	Altitude of the ray tracing grid nodes (**)	1.E-02	m	ul	150	0	0
$1918	Air density at the tangent point (**)		cm-3	fl	1	0	0
$1919	Atmospheric pressure at the tangent point (**)		Pa	fl	1	0	0
$191A	Air temperature at the ray tracing grid nodes (**)		K	fl	150	0	0
$191B	Spare		-	uc	32	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$1A00	No valid data flag		dl	uc	1	0	0
$1A01	Internal straylight correction flag		dl	uc	1	0	0
$1A02	External earth straylight correction flag		dl	uc	1	0	0
$1A03	External sun straylight correction flag		dl	uc	1	0	0
$1A04	Slit transmission correction flag		dl	uc	1	0	0
$1A05	PCD flag for reference star spectrum computation		dl	uc	1	0	0
$1A06	PCD flag indicating that the star spectrum has been read fro		dl	uc	1	0	0
$1A07	PCD flag indicating that the reference star spectrum has not		dl	uc	1	0	0
$1A08	PCD flag indicating that the SATU data have been used for fl		dl	uc	1	0	0
$1A09	PCD flag for the dark charge computation (photometers)		dl	uc	1	0	0
$1A0A	Spare		-	uc	8	0	0
$1A0B	Number of source packets containing errors		dl	ul	1	0	0
$1A0C	Level 0 PCD		dl	uc	1	0	0
$1A0D	Type of atmosphere file used		dl	uc	1	0	0
$1A0E	Dark charge correction information		dl	uc	1	0	0
$1A0F	Dark/bright limb conditions		dl	uc	1	0	0
$1A10	SDP extraction processing		dl	ul	1	0	0
$1A11	Datation errors		dl	ul	1	0	0
$1A12	Ray tracing errors		dl	ul	1	0	0
$1A13	Geolocation errors		dl	ul	1	0	0
$1A14	Saturation errors		dl	ul	1	0	0
$1A15	Cosmic rays errors		dl	ul	1	0	0
$1A16	Vignetting correction		dl	ul	1	0	0
$1A17	Central background		dl	ul	1	0	0
$1A18	Flat-field correction		dl	ul	1	0	0
$1A19	Full transmission errors		dl	ul	1	0	0

$1A1A	Bad pixels		dl	ul	1	0	0
$1A1B	Photometer saturation		dl	ul	2	0	0
$1A1C	Spare		-	uc	32	0	0

7.2 Limb product

Id	Description	Scale	Unit	St	N1	N2	N3
$2201	Number of points of the spectra		dl	us	4	0	0
$2202	Size of the calibration gain curve (background)		dl	uc	1	0	0
$2203	Abscissae of the calibration gain curve (background)	1.E-03	nm	ul	32	0	0
$2204	Calibration gain curve (background)		lf per e	fl	32	0	0
$2205	Time shift for ray tracing / geolocation	1.E-03	s	us	1	0	0
$2207	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$2301	Nominal wavelength assignment	1.E-06	nm	ul	2336	0	0
$2302	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$2400	Start time of the Data Set Record		mjd	mjd	3	0	0
$2401	Data quality indicator		-	sc	1	0	0
$2402	Scaled upper & lower background spectra without straylight c		e	us	22336		0
$2403	Scaled upper & lower background spectra after straylight and		e	us	22336		0
$2404	Error bar for the upper & lower background spectra after str		%	uc	22336		0
$2405	PCD at sample level		dl	us	2336	0	0
$2406	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$2500	Start time of the DSR		mjd	mjd	3	0	0
$2501	Attachment flag		dl	uc	1	0	0
$2502	Offset for the background spectra coding		e	fl	1	0	0
$2503	Gain for the background spectra coding		dl	fl	1	0	0
$2505	Latitude of the spacecraft (**)	1.E-06	deg	sl	1	0	0
$2504	Longitude of the spacecraft (**)	1.E-06	deg	sl	1	0	0
$2506	Altitude of the spacecraft (**)	1.E-02	m	ul	1	0	0
$2508	Latitude of the apparent tangent point (**)	1.E-06	deg	sl	2	0	0
$2507	Longitude of the apparent tangent point (**)	1.E-06	deg	sl	2	0	0
$2509	Altitude of the apparent tangent point (**)	1.E-02	m	ul	2	0	0
$250B	Error on the latitude of the apparent tangent point (**)	1.E-07	deg	sl	2	0	0
$250A	Error on longitude of the apparent tangent point (**)	1.E-07	deg	sl	2	0	0
$250C	Error on the altitude of the apparent tangent point (**)	1.E-03	m	ul	2	0	0
$250D	PCD at measurement level		dl	us	16	0	0
$250E	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$2600	No valid data flag		dl	uc	1	0	0
$2601	Internal straylight correction flag		dl	uc	1	0	0
$2602	External earth straylight correction flag		dl	uc	1	0	0
$2603	External sun straylight correction flag		dl	uc	1	0	0
$2604	Slit transmission correction flag		dl	uc	1	0	0
$2605	PCD flag for reference star spectrum computation		dl	uc	1	0	0
$2606	PCD flag indicating that the star spectrum has been read fro		dl	uc	1	0	0
$2607	PCD flag indicating that the reference star spectrum has not		dl	uc	1	0	0
$2608	PCD flag indicating that the SATU data have been used for fl		dl	uc	1	0	0
$2609	PCD flag for the dark charge computation (photometers)		dl	uc	1	0	0
$260A	Spare		-	uc	8	0	0
$260B	Number of source packets containing errors		dl	ul	1	0	0
$260C	Level 0 PCD		dl	uc	1	0	0
$260D	Type of atmosphere file used		dl	uc	1	0	0
$260E	Dark charge correction information		dl	uc	1	0	0
$260F	Dark/bright limb conditions		dl	uc	1	0	0
$2610	SDP extraction processing		dl	ul	1	0	0
$2611	Datation errors		dl	ul	1	0	0
$2612	Ray tracing errors		dl	ul	1	0	0

$2613 Geolocation errors			dl	ul	1	0	0
$2614 Saturation errors			dl	ul	1	0	0
$2615 Cosmic rays errors			dl	ul	1	0	0
$2616 Vignetting correction			dl	ul	1	0	0
$2617 Central background			dl	ul	1	0	0
$2618 Flat-field correction			dl	ul	1	0	0
$2619 Full transmission errors			dl	ul	1	0	0
$261A Bad pixels			dl	ul	1	0	0
$261B Photometer saturation			dl	ul	2	0	0
$261C Spare			-	uc	32	0	0

7.3 Level 2 product

Id	Description	Scale	Unit	St	N1	N2	N3
$3200	Start time of the Data Set Record		mjd	mjd	3	0	0
$3201	Data quality indicator		-	sc	1	0	0
$3202	Local O3 density		cm-3	fl	1	0	0
$3203	Standard deviation for the local O3 density	1.E-01	%	us	1	0	0
$3204	Local NO2 density		cm-3	fl	1	0	0
$3205	Standard deviation for the local NO2 density	1.E-01	%	us	1	0	0
$3206	Local NO3 density		cm-3	fl	1	0	0
$3207	Standard deviation for the local NO3 density	1.E-01	%	us	1	0	0
$3208	Local air density		cm-3	fl	1	0	0
$3209	Standard deviation for the local air density	1.E-01	%	us	1	0	0
$320A	Local O2 density		cm-3	fl	1	0	0
$320B	Standard deviation for the local O2 density	1.E-01	%	us	1	0	0
$320C	Local H2O density		cm-3	fl	1	0	0
$320D	Standard deviation for the local H2O density	1.E-01	%	us	1	0	0
$320E	Local OClO density		cm-3	fl	1	0	0
$320F	Standard deviation for the local OClO density	1.E-01	%	us	1	0	0
$3210	PCD summary		dl	uc	12	0	0
$3211	Spare		-	uc	12	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3300	Start time of the Data Set Record		mjd	mjd	3	0	0
$3301	Data quality indicator		-	sc	1	0	0
$3302	Tangent line density for O3		cm-2	fl	1	0	0
$3303	Standard deviation for O3 tangent line density	1.E-01	%	us	1	0	0
$3304	Tangent line density for NO2		cm-2	fl	1	0	0
$3305	Standard deviation for NO2 tangent line density	1.E-01	%	us	1	0	0
$3306	Tangent line density for NO3		cm-2	fl	1	0	0
$3307	Standard deviation for NO3 tangent line density	1.E-01	%	us	1	0	0
$3308	Tangent line density for air		cm-2	fl	1	0	0
$3309	Standard deviation for air tangent line density	1.E-01	%	us	1	0	0
$330A	Tangent line density for O2		cm-2	fl	1	0	0
$330B	Standard deviation for O2 tangent line density	1.E-01	%	us	1	0	0
$330C	Tangent line density for H2O		cm-2	fl	1	0	0
$330D	Standard deviation for H2O tangent line density	1.E-01	%	us	1	0	0
$330E	Tangent line density for OClO		cm-2	fl	1	0	0
$330F	Standard deviation for OClO tangent line density	1.E-01	%	us	1	0	0
$3312	Number of iterations in the spectral inversion		dl	us	1	0	0
$3310	PCD summary		dl	uc	12	0	0
$3311	Spare		-	uc	12	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3400	Start time of the Data Set Record		mjd	mjd	3	0	0
$3401	Data quality indicator		-	sc	1	0	0
$3402	Extinction coefficient		km-1	fl	1	0	0
$3403	Standard deviation of the extinction coefficient	1.E-01	%	us	1	0	0
$3404	Spectral parameters of the extinction coefficients		dl,nm-1,	fl	5	0	0
$3405	Standard deviation of the spectral parameters of the extinct	1.E-01	%	us	5	0	0
$3406	Tangent integrated extinction profile		dl	fl	1	0	0
$3407	Standard deviation of the tangent integrated extinction prof	1.E-01	%	us	1	0	0
$3408	Spectral parameters of the tangent integrated extinction pro		dl,nm-1,	fl	5	0	0

$3409	Standard deviation of the spectral parameters of the tangent	1.E-01	%	us	5	0	0
$340A	PCD summary		dl	uc	12	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3500	Start time of the Data Set Record		mjd	mjd	3	0	0
$3501	Data quality indicator		-	sc	1	0	0
$3502	Tangent altitude including fluctuations (*)		m	us	20	0	0
$3503	High resolution vertical temperature profile (*)	1.E-02	K	us	20	0	0
$3504	Local density		cm-3	fl	20	0	0
$3505	PCD summary		dl	us	20	0	0
$3506	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3600	Start time of the measurement		mjd	mjd	3	0	0
$3601	Attachement flag		dl	uc	1	0	0
$3603	Latitude of the spacecraft (*)	1.E-06	deg	sl	1	0	0
$3602	Longitude of the spacecraft (*)	1.E-06	deg	sl	1	0	0
$3604	Altitude of the spacecraft (*)	1.E-02	m	ul	1	0	0
$3606	Latitude of the tangent point (*)	1.E-06	deg	sl	1	0	0
$3605	Longitude of the tangent point (*)	1.E-06	deg	sl	1	0	0
$3607	Altitude of the tangent point (*)	1.E-02	m	ul	1	0	0
$3609	Error on the latitude of the tangent point (*)	1.E-07	deg	sl	1	0	0
$3608	Error on the longitude of the tangent point (*)	1.E-07	deg	sl	1	0	0
$360A	Error on the altitude of the tangent point (*)	1.E-03	m	ul	1	0	0
$360B	Tangent point atmospheric pressure (from external model)		Pa	fl	1	0	0
$360C	Tangent point temperature (from external model)		K	fl	1	0	0
$360D	Local air density from GOMOS atmospheric profile		cm-3	fl	1	0	0
$360E	Standard deviation for the local air density	1.E-01	%	us	1	0	0
$360F	Local temperature		K	fl	1	0	0
$3610	Standard deviation for the local temperature	1.E-01	%	us	1	0	0
$3611	PCD summary		dl	uc	1	0	0
$3612	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3700	Start time of the Data Set Record		mjd	mjd	3	0	0
$3701	Attachement flag		dl	uc	1	0	0
$3702	Chi-2 final value		dl	fl	1	0	0
$3703	Scale factor for the elements of the covariance matrix (spec		dl	sc	1	0	0
$3704	Covariance matrix for line densities after spectral inversio		cm-4	fl	78	0	0
$3705	Scale factor for the elements of the covariance matrix (vert		dl	sc	1	0	0
$3706	Covariance matrix for local densities after vertical inversi		cm-6	fl	84	0	0
$3707	Spare		-	uc	4	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3800	No valid data flag		dl	uc	1	0	0
$3801	Internal straylight correction flag		dl	uc	1	0	0
$3802	External earth straylight correction flag		dl	uc	1	0	0
$3803	External sun straylight correction flag		dl	uc	1	0	0
$3804	Slit transmission correction flag		dl	uc	1	0	0
$3805	PCD flag for reference star spectrum computation		dl	uc	1	0	0
$3806	PCD flag indicating that the star spectrum has been read fro		dl	uc	1	0	0
$3807	PCD flag indicating that the reference star spectrum has not		dl	uc	1	0	0
$3808	PCD flag indicating that the SATU data have been used for fl		dl	uc	1	0	0
$3809	PCD flag for the dark charge computation (photometers)		dl	uc	1	0	0
$380A	Spare		-	uc	8	0	0
$380B	Number of source packets containing errors		dl	ul	1	0	0
$380C	Level 0 PCD		dl	uc	1	0	0
$380D	Type of atmosphere file used		dl	uc	1	0	0
$380E	Dark charge correction information		dl	uc	1	0	0
$380F	Dark/bright limb conditions		dl	uc	1	0	0
$3810	SDP extraction processing		dl	ul	1	0	0
$3811	Datation errors		dl	ul	1	0	0
$3812	Ray tracing errors		dl	ul	1	0	0
$3813	Geolocation errors		dl	ul	1	0	0
$3814	Saturation errors		dl	ul	1	0	0
$3815	Cosmic rays errors		dl	ul	1	0	0
$3816	Vignetting correction		dl	ul	1	0	0
$3817	Central background		dl	ul	1	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$3818	Flat-field correction		dl	ul	1	0	0
$3819	Full transmission errors		dl	ul	1	0	0
$381A	Bad pixels		dl	ul	1	0	0
$381B	Photometer saturation		dl	ul	2	0	0
$381C	Spare		-	uc	32	0	0
$381D	Level 1b PCD check		dl	us	1	0	0
$381E	Chromatic refraction mode for the measured transmission		dl	us	1	0	0
$381F	Chromatic refraction mode for the transmission model (second		dl	us	1	0	0
$3820	Chromatic refraction mode for the transmission model (third		dl	us	1	0	0
$3821	Instrument function mode for the transmission model (second		dl	us	1	0	0
$3822	Instrument function mode for the transmission model (third a		dl	us	1	0	0
$3823	Vertical inversion mode		dl	us	1	0	0
$3824	Smoothing mode (after the spectral inversion)		dl	us	1	0	0
$3825	Time mode for the transmission model (second spectral invers		dl	us	1	0	0
$3826	Time mode for the transmission model (third and further spec		dl	us	1	0	0
$3827	Number of iterations for the main loop		dl	us	1	0	0
$3828	Number of iterations for the inversion loop		dl	us	1	0	0
$3829	Spare		-	uc	2	0	0
$382A	Number of points in profile column densities where chi2 > ch		dl	us	1	0	0
$382B	Number of flagged points in profile for air column densities		dl	us	1	0	0
$382C	Number of flagged points in profile for aerosol column densi		dl	us	1	0	0
$382D	Number of flagged points in profile for O3 column densities		dl	us	1	0	0
$382E	Number of flagged points in profile for NO2 column densities		dl	us	1	0	0
$382F	Number of flagged points in profile for NO3 column densities		dl	us	1	0	0
$3830	Number of flagged points in profile for OClO column densitie		dl	us	1	0	0
$3831	Number of flagged points in profile for O2 column densities		dl	us	1	0	0
$3832	Number of flagged points in profile for H2O column densities		dl	us	1	0	0
$383E	Spare		-	uc	10	0	0
$3833	Number of flagged points in profile for air local densities		dl	us	1	0	0
$3834	Number of flagged points in profile for aerosol local densit		dl	us	1	0	0
$3835	Number of flagged points in profile for O3 local densities		dl	us	1	0	0
$3836	Number of flagged points in profile for NO2 local densities		dl	us	1	0	0
$3837	Number of flagged points in profile for NO3 local densities		dl	us	1	0	0
$3838	Number of flagged points in profile for OClO local densities		dl	us	1	0	0
$3839	Number of flagged points in profile for O2 local densities		dl	us	1	0	0
$383A	Number of flagged points in profile for H2O local densities		dl	us	1	0	0
$383F	Spare		-	uc	10	0	0
$383B	Layer ratio used in vertical inversion *1000 (integer part o		dl	us	1	0	0
$383C	Not used		-	us	1	0	0
$383D	Spare		-	uc	64	0	0

7.4 Residual extinction product

Id	Description	Scale	Unit	St	N1	N2	N3
$4201	Nominal wavelength assignment	1.E-06	nm	ul	2336	0	0
$4202	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$4300	Start time of the DSR		mjd	mjd	3	0	0
$4301	Data quality indicator		-	sc	1	0	0
$4302	Transmission corrected for scintillation and dilution effect		dl	fl	2336	0	0
$4303	Transmission model function (*)		dl	us	2336	0	0
$4304	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$4400	Start time of the measurement		mjd	mjd	3	0	0
$4401	Attachment flag		dl	uc	1	0	0
$4403	Latitude of the spacecraft (*)	1.E-06	deg	sl	1	0	0
$4402	Longitude of the spacecraft (*)	1.E-06	deg	sl	1	0	0
$4404	Altitude of the spacecraft (*)	1.E-02	m	ul	1	0	0
$4406	Latitude of the tangent point (*)	1.E-06	deg	sl	1	0	0
$4405	Longitude of the tangent point (*)	1.E-06	deg	sl	1	0	0
$4407	Altitude of the tangent point (*)	1.E-02	m	ul	1	0	0
$4409	Error on the latitude of the tangent point (*)	1.E-07	deg	sl	1	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$4408	Error on the longitude of the tangent point (*)	1.E-07	deg	sl	1	0	0
$440A	Error on the altitude of the tangent point (*)	1.E-03	m	ul	1	0	0
$440B	Tangent point atmospheric pressure (from external model)		Pa	fl	1	0	0
$440C	Tangent point temperature (from external model)		K	fl	1	0	0
$440D	Local air density from GOMOS atmospheric profile		cm-3	fl	1	0	0
$440E	Standard deviation for the local air density	1.E-01	%	us	1	0	0
$440F	Spectral grid correction for the transmission model function	1.E-03	nm	us	2336	0	0
$4410	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$4500	No valid data flag		dl	uc	1	0	0
$4501	Internal straylight correction flag		dl	uc	1	0	0
$4502	External earth straylight correction flag		dl	uc	1	0	0
$4503	External sun straylight correction flag		dl	uc	1	0	0
$4504	Slit transmission correction flag		dl	uc	1	0	0
$4505	PCD flag for reference star spectrum computation		dl	uc	1	0	0
$4506	PCD flag indicating that the star spectrum has been read fro		dl	uc	1	0	0
$4507	PCD flag indicating that the reference star spectrum has not		dl	uc	1	0	0
$4508	PCD flag indicating that the SATU data have been used for fl		dl	uc	1	0	0
$4509	PCD flag for the dark charge computation (photometers)		dl	uc	1	0	0
$450A	Spare		-	uc	8	0	0
$450B	Number of source packets containing errors		dl	ul	1	0	0
$450C	Level 0 PCD		dl	uc	1	0	0
$450D	Type of atmosphere file used		dl	uc	1	0	0
$450E	Dark charge correction information		dl	uc	1	0	0
$450F	Dark/bright limb conditions		dl	uc	1	0	0
$4510	SDP extraction processing		dl	ul	1	0	0
$4511	Datation errors		dl	ul	1	0	0
$4512	Ray tracing errors		dl	ul	1	0	0
$4513	Geolocation errors		dl	ul	1	0	0
$4514	Saturation errors		dl	ul	1	0	0
$4515	Cosmic rays errors		dl	ul	1	0	0
$4516	Vignetting correction		dl	ul	1	0	0
$4517	Central background		dl	ul	1	0	0
$4518	Flat-field correction		dl	ul	1	0	0
$4519	Full transmission errors		dl	ul	1	0	0
$451A	Bad pixels		dl	ul	1	0	0
$451B	Photometer saturation		dl	ul	2	0	0
$451C	Spare		-	uc	32	0	0
$451D	Level 1b PCD check		dl	us	1	0	0
$451E	Chromatic refraction mode for the measured transmission		dl	us	1	0	0
$451F	Chromatic refraction mode for the transmission model (second		dl	us	1	0	0
$4520	Chromatic refraction mode for the transmission model (third		dl	us	1	0	0
$4521	Instrument function mode for the transmission model (second		dl	us	1	0	0
$4522	Instrument function mode for the transmission model (third a		dl	us	1	0	0
$4523	Vertical inversion mode		dl	us	1	0	0
$4524	Smoothing mode (after the spectral inversion)		dl	us	1	0	0
$4525	Time mode for the transmission model (second spectral invers		dl	us	1	0	0
$4526	Time mode for the transmission model (third and further spec		dl	us	1	0	0
$4527	Number of iterations for the main loop		dl	us	1	0	0
$4528	Number of iterations for the inversion loop		dl	us	1	0	0
$4529	Spare		-	uc	2	0	0
$452A	Number of points in profile column densities where chi2 > ch		dl	us	1	0	0
$452B	Number of flagged points in profile for air column densities		dl	us	1	0	0
$452C	Number of flagged points in profile for aerosol column densi		dl	us	1	0	0
$452D	Number of flagged points in profile for O3 column densities		dl	us	1	0	0
$452E	Number of flagged points in profile for NO2 column densities		dl	us	1	0	0
$452F	Number of flagged points in profile for NO3 column densities		dl	us	1	0	0
$4530	Number of flagged points in profile for OClO column densitie		dl	us	1	0	0
$4531	Number of flagged points in profile for O2 column densities		dl	us	1	0	0
$4532	Number of flagged points in profile for H2O column densities		dl	us	1	0	0
$453E	Spare		-	uc	10	0	0
$4533	Number of flagged points in profile for air local densities		dl	us	1	0	0
$4534	Number of flagged points in profile for aerosol local densit		dl	us	1	0	0
$4535	Number of flagged points in profile for O3 local densities		dl	us	1	0	0
$4536	Number of flagged points in profile for NO2 local densities		dl	us	1	0	0
$4537	Number of flagged points in profile for NO3 local densities		dl	us	1	0	0

$4538	Number of flagged points in profile for OClO local densities	dl	us	1	0	0
$4539	Number of flagged points in profile for O2 local densities	dl	us	1	0	0
$453A	Number of flagged points in profile for H2O local densities	dl	us	1	0	0
$453F	Spare	-	uc	10	0	0
$453B	Layer ratio used in vertical inversion *1000 (integer part o	dl	us	1	0	0
$453C	Not used	-	us	1	0	0
$453D	Spare	-	us	32	0	0

7.5 Instrument Physical Characteristics product

Id	Description	Scale	Unit	St	N1	N2	N3
$5201	Number of reference wavelengths for the static spectral PSF		dl	uc	1	0	0
$5202	Reference wavelengths of the static spectral PSF (SPA)	1.E-03	nm	ul	15	0	0
$5203	Number of points for the static spectral PSF (SPA)		dl	uc	1	0	0
$5204	Discretisation step of the static spectral PSF (SPA)	1.E-03	µm	ul	1	0	0
$5205	Static spectral PSF values (SPA)		dl	fl	450	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$5301	Number of reference wavelengths for the static spectral PSF		dl	uc	1	0	0
$5302	Reference wavelengths of the static spectral PSF (SPB)	1.E-03	nm	ul	15	0	0
$5303	Number of points for the static spectral PSF (SPB)		dl	uc	1	0	0
$5304	Discretisation step of the static spectral PSF (SPB)	1.E-03	µm	ul	1	0	0
$5305	Static spectral PSF values (SPB)		dl	fl	450	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$5401	Number of reference wavelengths for the static spatial PSF (		dl	uc	1	0	0
$5402	Reference wavelengths of the static spatial PSF (SPA)	1.E-03	nm	ul	15	0	0
$5403	Number of points for the static spatial PSF (SPA)		dl	uc	1	0	0
$5404	Discretisation step of the static spatial PSF (SPA)	1.E-03	µm	ul	1	0	0
$5405	Static spatial PSF values (SPA)		dl	fl	450	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$5501	Number of reference wavelengths for the static spatial PSF (		dl	uc	1	0	0
$5502	Reference wavelengths of the static spatial PSF (SPB)	1.E-03	nm	ul	15	0	0
$5503	Number of points for the static spatial PSF (SPB)		dl	uc	1	0	0
$5504	Discretisation step of the static spatial PSF (SPB)	1.E-03	µm	ul	1	0	0
$5505	Static spatial PSF values (SPB)		dl	fl	450	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$5601	Spectrometers sampling frequency		Hz	us	1	0	0
$5602	Photometers sampling frequency		Hz	us	1	0	0
$5603	SATU sampling frequency		Hz	us	1	0	0
$5604	SFA sampling frequency		Hz	us	1	0	0
$5605	Spectrometers sampling time	1.E-09	s	ul	1	0	0
$5606	Photometers sampling time	1.E-09	s	ul	1	0	0
$5607	SATU measurements coding offset	1.E-09	rad	sl	1	0	0
$5608	SATU measurements coding gain	1.E-09	rad/ADU	ul	1	0	0
$5609	SATU reference wavelength	1.E-03	nm	ul	1	0	0
$560A	Offset for SFA azimuth conversion	1.E-06	deg	sl	1	0	0
$560B	Relative offset for SFA azimuth conversion	1.E-06	deg	sl	1	0	0
$560C	Factor for SFA azimuth conversion (LSW)	1.E-09	deg/ADU	ul	1	0	0
$560D	Factor for SFA azimuth conversion (MSW)	1.E-06	deg/ADU	ul	1	0	0
$560E	Offset for SFA elevation conversion	1.E-06	deg	sl	1	0	0
$560F	Relative offset for SFA elevation conversion	1.E-06	deg	sl	1	0	0
$5610	Factor for SFA elevation conversion (LSW)	1.E-09	deg/ADU	ul	1	0	0
$561A	Factors for the conversion of the SFA angles from SFM axes t		-	fl	10	0	0
$5611	Spectrometers focal lengths	1.E-04	m	us	4	0	0
$5612	Photometers focal lengths	1.E-04	m	us	2	0	0
$5613	Slit width	1.E-09	m	ul	1	0	0
$5614	Mean pixel size in the spatial direction (SP)	1.E-09	m	us	4	0	0
$5615	Mean pixel size in the spectral direction (SP)	1.E-09	m	us	4	0	0
$5616	Mean pixel size (FP)	1.E-09	m	us	2	0	0
$5617	Lower wavelength of the invalid spectral range		nm	fl	1	0	0

$5618	Higher wavelength of the invalid spectral range		nm	fl	1	0	0
$5619	Spare		-	uc	24	0	0

7.6 Calibration product

Id	Description	Scale	Unit	St	N1	N2	N3
$6201	Number of bad pixels in the SPA CCD1		dl	uc	1	0	0
$6202	Column index of the bad pixels of SPA CCD1		dl	us	128	0	0
$6203	Line index of the bad pixels of SPA CCD1		dl	uc	128	0	0
$6204	Number of bad pixels in the SPA CCD2		dl	uc	1	0	0
$6205	Column index of the bad pixels of SPA CCD2		dl	us	128	0	0
$6206	Line index of the bad pixels of SPA CCD2		dl	uc	128	0	0
$6207	Number of bad pixels in the SPB CCD1		dl	uc	1	0	0
$6208	Column index of the bad pixels of SPB CCD1		dl	us	128	0	0
$6209	Line index of the bad pixels of SPB CCD1		dl	uc	128	0	0
$620A	Number of bad pixels in the SPB CCD2		dl	uc	1	0	0
$620B	Column index of the bad pixels of SPB CCD2		dl	us	128	0	0
$620C	Line index of the bad pixels of SPB CCD2		dl	uc	128	0	0
$620D	Number of bad pixels in FP1		dl	uc	1	0	0
$620E	Column index of the bad pixels of FP1		dl	uc	16	0	0
$620F	Line index of the bad pixels of FP1		dl	uc	16	0	0
$6210	Number of bad pixels in the FP2		dl	uc	1	0	0
$6211	Column index of the bad pixels of FP2		dl	uc	16	0	0
$6212	Line index of the bad pixels of FP2		dl	uc	16	0	0
$6213	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6301	Spectrometer A electronic chain gain	1.E-03	e /ADU	ul	2	2	4
$6302	Spectrometer B electronic chain gain	1.E-03	e /ADU	ul	2	2	4
$6303	Photometers electronic chain gain	1.E-03	e /ADU	ul	2	2	0
$6304	ADC offsets for the spectrometers	1.E-01	ADU	us	4	4	0
$6305	ADC offset for photometers	1.E-01	ADU	us	2	0	0
$6306	Non-linearity look-up table for SPA CCD 1	1.E-02	%	ss	2	44096	
$6307	Non-linearity look-up table for SPA CCD 2	1.E-02	%	ss	2	44096	
$6308	Non-linearity look-up table for SPB CCD 1	1.E-02	%	ss	2	44096	
$6309	Non-linearity look-up table for SPB CCD 2	1.E-02	%	ss	2	44096	
$630A	Non-linearity look-up table for FP1	1.E-02	%	ss	24096	0	
$630B	Non-linearity look-up table for FP2	1.E-02	%	ss	24096	0	
$630C	Detection chain offset for the spectrometers	1.E-01	e	ul	4	0	0
$630D	Detection chain offset for the fast photometers	1.E-01	e	ul	2	0	0
$630E	Spare		-	uc	32	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6401	Index of the first CCD line for the spectrometers dark charg		dl	uc	4	0	0
$6402	Spectrometers dark charge maps width (in number of lines)		dl	uc	1	0	0
$6403	Size of the thermistor coding LUT (***)		dl	uc	6	0	0
$6404	Abscissae of the thermistor coding LUT (***)		ADU	us	6	64	0
$6405	Thermistor coding LUT (***)	1.E-02	°C	ss	6	64	0
$6406	Thermistor reference temperature for the spectrometers dark	1.E-03	K	ul	4	0	0
$6407	Thermistor reference temperature for the photometers dark ch	1.E-03	K	ul	2	0	0
$6408	Offset between the thermistor temperature and the CCD temper	1.E-03	°C	ss	6	0	0
$6409	Dark charge map at the thermistor reference temperature FP_T	1.E-01	e	ul	14	14	0
$640A	Dark charge map at the thermistor reference temperature FP_T	1.E-01	e	ul	14	14	0
$640B	Temperature variation which doubles the dark charge for FP1	1.E-03	K	us	14	14	0
$640C	Temperature variation which doubles the dark charge for FP2	1.E-03	K	us	14	14	0
$640D	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6501	Index of the first CCD line for the spectrometer non-uniform		dl	uc	4	0	0
$6502	Spectrometers non-uniformity maps width (in number of lines)		dl	uc	1	0	0
$6506	Slit width variation		dl	fl	4	143	0
$6503	FP1 relative pixel response non-uniformity (*)	1.E-04	dl	us	14	14	0
$6504	FP2 relative pixel response non-uniformity (*)	1.E-04	dl	us	14	14	0
$6505	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6601	Number of CCD regions for the reduced straylight maps (spati		dl	uc	2	0	0
$6602	Number of CCD pixels per region (spatial and spectral direct		dl	uc	2	0	0
$660A	First column index for the reduced straylight maps		dl	us	4	0	0
$660B	First line index for the reduced straylight maps		dl	us	4	0	0
$6603	Reduced internal straylight map for SPA CCD 1		e	fl	136	15	0
$6604	Reduced internal straylight map for SPA CCD 2		e	fl	136	15	0
$6605	Reduced internal straylight map for SPB CCD 1		e	fl	136	15	0
$6606	Reduced internal straylight map for SPB CCD 2		e	fl	136	15	0
$6607	Full internal straylight map for FP1		e	fl	14	14	0
$6608	Full internal straylight map for FP2		e	fl	14	14	0
$6609	Spare		-	uc	10	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6701	Spectrometers electronic chain noise (n0) (*)	1.E-01	e	us	4	4	0
$6702	Photometers electronic chain noise (n0)	1.E-01	e	us	2	0	0
$6703	Size of the Spectrometers noise LUT (*)		dl	uc	4	4	0
$6704	Abscissae of the Spectrometers noise LUT (**)		ADU	us	4	4	64
$6705	Spectrometers noise LUT (**)		e	fl	4	4	64
$6706	Size of the Photometers noise LUT (***)		dl	uc	2	0	0
$6707	Abscissae of the Photometers noise LUT (****)		ADU	us	2	64	0
$6708	Photometers noise LUT (****)		e	fl	2	64	0
$6709	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6800	Creation time of the DSR		mjd	mjd	3	0	0
$6801	Quality indicator flag		-	sc	1	0	0
$6802	Spectrometer A CCD1 dark charge map at the thermistor refere	1.E-01	e	ul	1353	0	0
$6803	Spectrometer A CCD2 dark charge map at the thermistor refere	1.E-01	e	ul	1353	0	0
$6804	Spectrometer B CCD1 dark charge map at the thermistor refere	1.E-01	e	ul	1353	0	0
$6805	Spectrometer B CCD2 dark charge map at the thermistor refere	1.E-01	e	ul	1353	0	0
$6806	Temperature variation which doubles the dark charge (SPA CCD	1.E-03	K	us	1353	0	0
$6807	Temperature variation which doubles the dark charge (SPA CCD	1.E-03	K	us	1353	0	0
$6808	Temperature variation which doubles the dark charge (SPB CCD	1.E-03	K	us	1353	0	0
$6809	Temperature variation which doubles the dark charge (SPB CCD	1.E-03	K	us	1353	0	0
$680A	Spare		-	uc	32	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6900	Creation time of the DSR		mjd	mjd	3	0	0
$6901	Quality indicator flag		-	sc	1	0	0
$6902	SPA CCD1 pixel relative response non-uniformity	1.E-04	dl	us	1353	0	0
$6903	SPA CCD2 pixel relative response non-uniformity	1.E-04	dl	us	1353	0	0
$6904	SPB CCD1 pixel relative response non-uniformity	1.E-04	dl	us	1353	0	0
$6905	SPB CCD2 pixel relative response non-uniformity	1.E-04	dl	us	1353	0	0
$6906	Spare		-	uc	32	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6A00	Creation time of the DSR		mjd	mjd	3	0	0
$6A01	Quality indicator flag		-	sc	1	0	0
$6A02	Sun-star angle		deg	fl	1	0	0
$6A03	Reduced external Sun straylight map for SPA CCD 1		e	fl	136	15	0
$6A04	Reduced external Sun straylight map for SPA CCD 2		e	fl	136	15	0
$6A05	Reduced external Sun straylight map for SPB CCD 1		e	fl	136	15	0
$6A06	Reduced external Sun straylight map for SPB CCD 2		e	fl	136	15	0
$6A07	Full external Sun straylight map for FP1		e	fl	14	14	0
$6A08	Full external Sun straylight map for FP2		e	fl	14	14	0
$6A09	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6B00	Creation time of the DSR		mjd	mjd	3	0	0
$6B01	Quality indicator flag		-	sc	1	0	0
$6B02	Altitude		m	fl	1	0	0
$6B03	Reduced external Earth straylight map for SPA CCD 1		e	fl	136	15	0
$6B04	Reduced external Earth straylight map for SPA CCD 2		e	fl	136	15	0
$6B05	Reduced external Earth straylight map for SPB CCD 1		e	fl	136	15	0
$6B06	Reduced external Earth straylight map for SPB CCD 2		e	fl	136	15	0
$6B07	Full external Earth straylight map for FP1		e	fl	14	14	0

Id	Description	Scale	Unit	St	N1	N2	N3
$6B08	Full external Earth straylight map for FP2		e	fl	14	14	0
$6B09	Spare		-	uc	16	0	0
$6C01	Validity duration of the Calibration database		mjd	mjd	3	0	0
$6C02	First used column on the CCD array for SPA and SPB		dl	us	4	0	0
$6C03	Number of used columns for the CCD arrays of SPA and SPB		dl	us	4	0	0
$6C04	First used lines of the CCD arrays		dl	us	4	0	0
$6C05	Number of lines of the background bands		dl	us	4	0	0
$6C06	Number of lines of the isolation bands		dl	us	4	0	0
$6C07	Number of lines of the target bands		dl	us	4	0	0
$6C08	First used column of the FP1 CCD array		dl	uc	1	0	0
$6C09	Last used column of the FP1 CCD array		dl	uc	1	0	0
$6C0A	First used column of the FP2 CCD array		dl	uc	1	0	0
$6C0B	Last used column of the FP2 CCD array		dl	uc	1	0	0
$6C0C	First used line of the FP1 CCD array		dl	uc	1	0	0
$6C0D	Last used line of the FP1 CCD array		dl	uc	1	0	0
$6C0E	First used line of the FP2 CCD array		dl	uc	1	0	0
$6C0F	Last used line of the FP2 CCD array		dl	uc	1	0	0
$6C10	Column index for the nominal wavelength assignment		dl	us	4	0	0
$6C11	Nominal wavelength assignment of one CCD column	1.E-03	nm	ul	4	0	0
$6C12	Star spot semi axis length in the X axis frame of the FP CCD	1.E-09	m	ul	1	0	0
$6C13	Star spot semi axis length in the Y axis frame of the FP CCD	1.E-09	m	ul	1	0	0
$6C14	Nominal CCD line index of the star spectrum projection (SP)		dl	us	4	0	0
$6C15	Nominal CCD column of the star spot centre (FP)		dl	uc	2	0	0
$6C16	Nominal CCD line of the star spot centre (FP)		dl	uc	2	0	0
$6C17	Wavelength assignment of the lowest used CCD column for SPA	1.E-03	nm	ul	1	0	0
$6C18	Wavelength assignment of the lowest used CCD column for SPA	1.E-03	nm	ul	1	0	0
$6C19	Wavelength assignment of the lowest used CCD column for SPB	1.E-03	nm	ul	1	0	0
$6C1A	Wavelength assignment of the lowest used CCD column for SPB	1.E-03	nm	ul	1	0	0
$6C1B	Size of the spectral dispersion LUT		dl	uc	1	0	0
$6C1C	Wavelength values for the spectral dispersion LUT	1.E-03	nm	ul	30	0	0
$6C1D	Spectral dispersion of the spectrometers as a function of th	1.E-03	nm /mm	ul	30	0	0
$6C1E	Lower wavelength of the band of FP1	1.E-03	nm	ul	1	0	0
$6C1F	Higher wavelength of the band of FP1	1.E-03	nm	ul	1	0	0
$6C20	Lower wavelength of the band of FP2	1.E-03	nm	ul	1	0	0
$6C21	Higher wavelength of the band of FP2	1.E-03	nm	ul	1	0	0
$6C3C	Size of the FP transmission curves		dl	uc	2	0	0
$6C3D	Wavelengths of the FP transmission curves	1.E-03	nm	ul	2	32	0
$6C3E	FP transmission curves		%	fl	2	32	0
$6C22	Size of the slit transmission LUT		dl	uc	1	0	0
$6C23	Angles for the slit transmission LUT	1.E-06	deg	sl	10	0	0
$6C24	Slit transmission LUT	1.E-04	dl	us	10	0	0
$6C25	Size of the LUT for the conversion between spectrometers and		dl	uc	2	0	0
$6C26	Spectral grid for the transformation between electrons recei	1.E-03	nm	ul	2	10	0
$6C27	Transformation between electrons received by spectrometers a		dl	fl	2	10	0
$6C28	Number of points of the calibration gain curve for the conve		dl	uc	1	0	0
$6C29	Abscissae of the calibration gain curve for the conversion o	1.E-03	nm	ul	32	0	0
$6C2A	Calibration gain curve for the conversion of the limb radian		lf per e	fl	32	0	0
$6C2B	Number of points of the calibration gain curve for the conve		dl	uc	1	0	0
$6C2C	Abscissae of the calibration gain curve for the conversion o	1.E-03	nm	ul	32	0	0
$6C2D	Calibration gain curve for the conversion of the star spectr		sf per e	fl	32	0	0
$6C2E	Relative spectral orientation of the CCD wrt to the column i		dl	sc	4	0	0
$6C2F	Relative orientation of the CCD wrt the SATU		dl	sc	6	2	0
$6C30	Number of azimuth angles used to define the vignetting LUT		dl	uc	1	0	0
$6C31	Azimuth angles used to define the vignetting LUT	1.E-02	deg	ss	7	0	0
$6C32	Number of elevation angles used to define the vignetting LUT		dl	uc	1	0	0
$6C33	Elevation angles used to define the vignetting LUT	1.E-02	deg	ss	5	0	0
$6C34	Vignetting LUT		%	uc	5	7	0
$6C35	Size of the reflectivity LUT		dl	uc	1	0	0
$6C36	Wavelengths used to define the reflectivity LUT	1.E-03	nm	ul	64	0	0
$6C38	Reflectivity LUT	1.E-02	%/deg	ss	64	0	0
$6C3A	Number of instable measurements at the beginning of the occu		dl	ul	1	0	0
$6C3B	SATU window shift during the wavelength calibration		dl	uc	1	0	0
$6C39	Spare		-	uc	57	0	0

7.7 Level 1b processing configuration product

Id	Description	Scale	Unit	St	N1	N2	N3
$7201	Standard acceleration of gravity		m.s-2	fl	1	0	0
$7202	Reference pressure		hPa	fl	1	0	0
$7203	Air density in standard conditions of temperature and pressu		kg/m3	fl	1	0	0
$7204	Absolute Reference pressure		Pa	fl	1	0	0
$7205	Avogadro number		mole-1	fl	1	0	0
$7206	Universal gas constant		J/mole/K	fl	1	0	0
$7207	Molecular weight of the dry air		kg/mole	fl	1	0	0
$7208	Reference pressure level values		hPa	fl	15	0	0
$7209	Number of altitude grid points for lower part of the atmosph		dl	us	1	0	0
$720A	Number of altitude grid points for upper part of the atmosph		dl	us	1	0	0
$720B	Minimum altitude for lower part of the atmosphere		km	fl	1	0	0
$720C	Minimum altitude for upper part of the atmosphere		km	fl	1	0	0
$720D	Altitude step for lower part of the atmosphere		km	fl	1	0	0
$720E	Altitude step for upper part of the atmosphere		km	fl	1	0	0
$720F	Number of pressure levels for lower part of the atmosphere		dl	us	1	0	0
$7210	Number of pressure levels for upper part of the atmosphere		dl	us	1	0	0
$7211	Index of the reference level for the iterative verification		dl	us	1	0	0
$7212	Index for the spatial resolution		dl	ss	1	0	0
$7214	Initial latitude value for the spatial grid (ref.)	1.E-06	deg	sl	1	0	0
$7213	Initial longitude value for the spatial grid (ref.)	1.E-06	deg	sl	1	0	0
$7216	Reference discretisation step in latitude		deg	fl	1	0	0
$7215	Reference discretisation step in longitude		deg	fl	1	0	0
$7217	Threshold for the convergence of the iterative process		m	fl	1	0	0
$7218	Maximum iteration number for the iterative process		dl	us	1	0	0
$7219	Delta angle for the atmosphere zone in the occultation area		deg	fl	1	0	0
$721A	Transition height expressed in number of atmospheric scale h		dl	fl	1	0	0
$721B	Size of the reference atmospheric profile		dl	us	1	0	0
$721C	First altitude of the profile		km	fl	1	0	0
$721D	Altitude discretisation		km	fl	1	0	0
$721E	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$7301	Cosmic rays processing activation switch		dl	uc	1	0	0
$7302	Dark charge correction processing activation switch		dl	uc	1	0	0
$7303	Internal straylight correction activation switch		dl	uc	1	0	0
$7304	External earth straylight correction activation switch		dl	uc	1	0	0
$7305	External sun straylight correction activation switch		dl	uc	1	0	0
$7306	Central background estimation mode		dl	uc	1	0	0
$7307	SATU data use activation switch		dl	uc	1	0	0
$7308	Vignetting activation switch		dl	uc	1	0	0
$7309	Flat-field correction mode		dl	uc	1	0	0
$7335	Flat-field correction switches		dl	uc	4	0	0
$7330	Interpolation mode for spectra resampling		dl	uc	1	0	0
$732F	Spectral grid selection for transmission computation		dl	uc	1	0	0
$730A	Covariance computation mode		dl	uc	1	0	0
$7333	Non-linearity correction activation switch		dl	uc	1	0	0
$7334	Reflectivity correction activation switch		dl	uc	1	0	0
$730C	Spare		-	uc	2	0	0
$730D	Identifier of Earth model		-	uc	1	0	0
$730E	Flattening of the Earth		dl	fl	1	0	0
$730F	Earth equatorial radius		m	fl	1	0	0
$7310	Atmosphere thickness		m	fl	1	0	0
$7311	Earth orbit eccentricity		dl	fl	1	0	0
$7312	Gravitational constant for the Sun		m3/s2	fl	1	0	0
$7313	Angle between the vernal axis and the Earth orbit perihelion		deg	fl	1	0	0
$7314	Earth orbit semi-major axis		m	fl	1	0	0
$7315	Light speed		m/s	ul	1	0	0
$7316	Spare		-	uc	8	0	0
$7317	Ray tracing parameters		dl	fl	10	0	0
$7318	Time shift for ray tracing computation	1.E-03	s	ul	1	0	0
$7319	Minimum wavelength value for ray-tracing	1.E-03	nm	ul	1	0	0
$731A	Maximum wavelength value for ray-tracing	1.E-03	nm	ul	1	0	0

$731B	Reference wavelength for the ray tracing	1.E-03	nm	ul	1	0	0
$731C	Spare		-	uc	8	0	0
$731D	Spectrometer sample saturation level		ADU	us	4	4	0
$731E	Photometer data saturation level		ADU	us	2	0	0
$731F	Half-number of measurements for CR detection		dl	uc	1	0	0
$7320	Half-number of CCD columns for CR detection		dl	uc	1	0	0
$7321	Threshold for relative variation of the signal for cosmic ra		%	uc	1	0	0
$7322	Threshold for absolute variation of the signal for cosmic ra		ADU	us	1	0	0
$7323	Threshold for cosmic rays detection activation		ADU	us	1	0	0
$7324	Number of frames for dark charge estimation		dl	uc	1	0	0
$7325	Threshold for background correction (dark limb)		e	ul	1	0	0
$7326	Threshold for background correction (bright limb)		e	ul	1	0	0
$7327	Altitude range used in the estimated central background comp		m	ul	1	0	0
$7328	Order of the polynomial used in the estimated central backgr		dl	uc	1	0	0
$7329	Photometer index for the scintillation correction in the fla		dl	us	1	0	0
$732A	Spare		-	uc	8	0	0
$732B	Number of measurements to be used for the reference star spe		dl	us	1	0	0
$732C	Maximum number of star spectra to be checked for the computa		dl	us	1	0	0
$732D	Minimum number of star spectra used to compute the reference		dl	us	1	0	0
$7331	Threshold for MPH error indicator computation	1.E-02	%	ul	1	0	0
$7332	Minimum altitudes for the computation of the reference star		m	ul	4	0	0
$732E	Spare		-	uc	8	0	0

7.8 Star catalogue product

Id	Description	Scale	Unit	St	N1	N2	N3
$8200	Creation time of the MDSR		mjd	mjd	3	0	0
$8201	Quality indicator flag		-	sc	1	0	0
$8202	Star identifier number in the GOMOS catalogue		dl	ul	1	0	0
$8203	Hipparcos Input Catalogue		dl	ul	1	0	0
$8204	Component(s) considered		-	uc	4	0	0
$8205	Satellite target		-	uc	1	0	0
$8206	HD/HDE number		dl	ul	1	0	0
$8207	BD number		-	uc	13	0	0
$8208	CD number		-	uc	13	0	0
$8209	CPD number		-	uc	13	0	0
$820A	FK5		-	uc	7	0	0
$820B	AGK3/CPC number		-	uc	10	0	0
$820C	SAO number		dl	ul	1	0	0
$820D	First of the two selected identifiers		-	uc	9	0	0
$820E	Second of the two selected identifiers		-	uc	11	0	0
$820F	Other identifiers		-	uc	13	0	0
$8210	Right ascension hours (J2000)		h	ul	1	0	0
$8211	Right ascension minutes (J2000)		mn	ul	1	0	0
$8212	Right ascension seconds (J2000)		s	fl	1	0	0
$8213	Declination degrees (J2000)		deg	sl	1	0	0
$8214	Declination arcmin (J2000)		arcmin	ul	1	0	0
$8215	Declination arcsec (J2000)		arcsec	fl	1	0	0
$8216	Right ascension decimal degrees (J2000)		deg	fl	1	0	0
$8217	Declination decimal degrees (J2000)		deg	fl	1	0	0
$8218	Standard error in the right ascension		milliarc	fl	1	0	0
$8219	Standard error in the declination		milliarc	fl	1	0	0
$821A	source of position		-	uc	1	0	0
$821B	Right ascension hours (B1950)		h	ul	1	0	0
$821C	Right ascension minutes (B1950)		mn	ul	1	0	0
$821D	Right ascension seconds (B1950)		s	fl	1	0	0
$821E	Declination degrees (B1950)		deg	sl	1	0	0
$821F	Declination arcmin (B1950)		arcmin	ul	1	0	0
$8220	Declination arcsec (B1950)		arcsec	fl	1	0	0
$8221	Epoch for the position		y	ul	1	0	0
$8223	Galactic latitude	1.E-06	deg	sl	1	0	0
$8222	Galactic longitude	1.E-06	deg	sl	1	0	0
$8225	Ecliptic latitude	1.E-06	deg	sl	1	0	0
$8224	Ecliptic longitude	1.E-06	deg	sl	1	0	0

$8226	Magnitude in the Hipparcos photometric system		dl	fl	1	0	0
$8227	V magnitude		dl	fl	1	0	0
$8228	Error of V magnitude		dl	fl	1	0	0
$8229	B-V		dl	fl	1	0	0
$822A	Error of B-V		dl	fl	1	0	0
$822B	Source of photometry		-	uc	1	0	0
$822C	Variability code 1		-	uc	1	0	0
$822D	Variability code 2		-	uc	1	0	0
$822E	CCDM number		-	uc	10	0	0
$822F	Components considered		-	uc	2	0	0
$8230	Position angle between the components (deg)		-	uc	4	0	0
$8231	Separation between the components considered		arcsec	fl	1	0	0
$8232	Magnitude difference between the components considered		dl	fl	1	0	0
$8233	Multiplicity type		-	uc	1	0	0
$8234	Variable star name		-	uc	9	0	0
$8235	Type of variability		-	uc	3	0	0
$8236	Period of variation (days)		d	fl	1	0	0
$8237	V magnitude at maximum luminosity		dl	fl	1	0	0
$8238	V magnitude at minimum luminosity		dl	fl	1	0	0
$8239	Coded error of the V		-	uc	1	0	0
$823A	Code specifying the magnitudes		-	uc	1	0	0
$823B	Parallax		milli-ar	sl	1	0	0
$823C	Standard error of parallax		milli-ar	ul	1	0	0
$823D	Type of parallax		-	uc	1	0	0
$823E	Proper motion in right ascension		arcsec/y	fl	1	0	0
$823F	Proper motion in declination		arcsec/y	fl	1	0	0
$8240	Error of the proper motion in right ascension		milli-ar	fl	1	0	0
$8241	Error of the proper motion in declination		milli-ar	fl	1	0	0
$8242	Source of proper motion		-	uc	1	0	0
$8243	Radial velocity		km/s	fl	1	0	0
$8244	Quality of radial velocity		-	uc	1	0	0
$8245	Source of radial velocity		-	uc	1	0	0
$8246	Spectral type and luminosity class		-	uc	11	0	0
$8247	Source of the spectral type type data		-	uc	1	0	0
$8248	Survey/identification chart		-	uc	1	0	0
$8249	Hr number		dl	ul	1	0	0
$8251	Star name in the BSC catalogue		-	uc	25	0	0
$824A	U-B on Johnson system		-	fl	1	0	0
$824B	R-I on johnson system		-	fl	1	0	0
$824C	vsini (Projected rotational velocities) (km/s)		-	uc	5	0	0
$824D	Effective temperature		K	ul	1	0	0
$824E	Quality codes 1		-	uc	10	0	0
$824F	Quality codes 2		-	uc	10	0	0
$8250	Spare		-	uc	28	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$8301	Number of targets in the Star Catalogue		dl	ul	1	0	0
$8302	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$8400	Number of input star catalogues		dl	uc	1	0	0
$8401	Filenames of the input star catalogue		-	uc	10	32	0
$8402	Filename of the dark areas list		-	uc	32	0	0
$8403	Spare		-	uc	8	0	0
$8404	Minimum temperature for tracking		K	fl	1	0	0
$8405	Maximum temperature for tracking		K	fl	1	0	0
$8406	Spare		-	uc	8	0	0
$8407	Magnitude threshold for minimum temperature (red stars)		dl	fl	1	0	0
$8408	Magnitude threshold for maximum temperature (blue stars)		dl	fl	1	0	0
$8409	Spare		-	uc	8	0	0
$840A	Maximum angular separation under which a 'double' star is co		deg	fl	1	0	0
$840B	Distance between 2 stars to identify a 'single' or a 'multip		deg	fl	1	0	0
$840C	Magnitude difference between 2 stars to identify a 'single'		dl	fl	1	0	0
$840D	Distance between 2 stars to identify a 'single' or a 'multip		deg	fl	1	0	0
$840E	Magnitude difference between 2 stars to identify a 'single'		dl	fl	1	0	0
$840F	Spare		-	uc	8	0	0
$8410	Maximum brightness variability for a star to be in the GOMOS		%	fl	1	0	0

$8411 Period for maximum variability for a star to be in the GOMOS		s	fl	1	0	0
$8412 Spare		-	uc	8	0	0
$8413 Magnitude detection limit for dark areas		dl	fl	1	0	0
$8414 FOV detection cone radius for dark areas		deg	fl	1	0	0
$8415 Magnitude detection limit for single/double stars		dl	fl	1	0	0
$8416 Spare		-	uc	8	0	0

7.9 Stellar spectra databank product

Id	Description	Scale	Unit	St	N1	N2	N3
$9201	Size of the spectra		dl	us	1	0	0
$9202	Wavelength assignment of the star spectra	1.E-03	nm	ul	3000	0	0
$9203	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$9300	Creation time of the MDSR		mjd	mjd	3	0	0
$9301	Quality indicator flag		-	sc	1	0	0
$9302	Star identifier number in the GOMOS catalogue		dl	ul	1	0	0
$9303	Hipparcos Input Catalogue		dl	ul	1	0	0
$9304	Component(s) considered		-	uc	4	0	0
$9305	Satellite target		-	uc	1	0	0
$9306	HD/HDE number		dl	ul	1	0	0
$9307	BD number		-	uc	13	0	0
$9308	CD number		-	uc	13	0	0
$9309	CPD number		-	uc	13	0	0
$930A	FK5		-	uc	7	0	0
$930B	AGK3/CPC number		-	uc	10	0	0
$930C	SAO number		dl	ul	1	0	0
$930D	First of the two selected identifiers		-	uc	9	0	0
$930E	Second of the two selected identifiers		-	uc	11	0	0
$930F	Other identifiers		-	uc	13	0	0
$9310	Right ascension hours (J2000)		h	ul	1	0	0
$9311	Right ascension minutes (J2000)		mn	ul	1	0	0
$9312	Right ascension seconds (J2000)		s	fl	1	0	0
$9313	Declination degrees (J2000)		deg	sl	1	0	0
$9314	Declination arcmin (J2000)		arcmin	ul	1	0	0
$9315	Declination arcsec (J2000)		arcsec	fl	1	0	0
$9316	Right ascension decimal degrees (J2000)		deg	fl	1	0	0
$9317	Declination decimal degrees (J2000)		deg	fl	1	0	0
$9318	Standard error in the right ascension		milliarc	fl	1	0	0
$9319	Standard error in the declination		milliarc	fl	1	0	0
$931A	source of position		-	uc	1	0	0
$931B	Right ascension hours (B1950)		h	ul	1	0	0
$931C	Right ascension minutes (B1950)		mn	ul	1	0	0
$931D	Right ascension seconds (B1950)		s	fl	1	0	0
$931E	Declination degrees (B1950)		deg	sl	1	0	0
$931F	Declination arcmin (B1950)		arcmin	ul	1	0	0
$9320	Declination arcsec (B1950)		arcsec	fl	1	0	0
$9321	Epoch for the position		y	ul	1	0	0
$9323	Galactic latitude	1.E-06	deg	sl	1	0	0
$9322	Galactic longitude	1.E-06	deg	sl	1	0	0
$9325	Ecliptic latitude	1.E-06	deg	sl	1	0	0
$9324	Ecliptic longitude	1.E-06	deg	sl	1	0	0
$9326	Magnitude in the Hipparcos photometric system		dl	fl	1	0	0
$9327	V magnitude		dl	fl	1	0	0
$9328	Error of V magnitude		dl	fl	1	0	0
$9329	B-V		dl	fl	1	0	0
$932A	Error of B-V		dl	fl	1	0	0
$932B	Source of photometry		-	uc	1	0	0
$932C	Variability code 1		-	uc	1	0	0
$932D	Variability code 2		-	uc	1	0	0
$932E	CCDM number		-	uc	10	0	0
$932F	Components considered		-	uc	2	0	0
$9330	Position angle between the components (deg)		-	uc	4	0	0
$9331	Separation between the components considered		arcsec	fl	1	0	0

$9332	Magnitude difference between the components considered		dl	fl	1	0	0
$9333	Multiplicity type		-	uc	1	0	0
$9334	Variable star name		-	uc	9	0	0
$9335	Type of variability		-	uc	3	0	0
$9336	Period of variation (days)		d	fl	1	0	0
$9337	V magnitude at maximum luminosity		dl	fl	1	0	0
$9338	V magnitude at minimum luminosity		dl	fl	1	0	0
$9339	Coded error of the V		-	uc	1	0	0
$933A	Code specifying the magnitudes		-	uc	1	0	0
$933B	Parallax		milli-ar	sl	1	0	0
$933C	Standard error of parallax		milli-ar	ul	1	0	0
$933D	Type of parallax		-	uc	1	0	0
$933E	Proper motion in right ascension		arcsec/y	fl	1	0	0
$933F	Proper motion in declination		arcsec/y	fl	1	0	0
$9340	Error of the proper motion in right ascension		milli-ar	fl	1	0	0
$9341	Error of the proper motion in declination		milli-ar	fl	1	0	0
$9342	Source of proper motion		-	uc	1	0	0
$9343	Radial velocity		km/s	fl	1	0	0
$9344	Quality of radial velocity		-	uc	1	0	0
$9345	Source of radial velocity		-	uc	1	0	0
$9346	Spectral type and luminosity class		-	uc	11	0	0
$9347	Source of the spectral type type data		-	uc	1	0	0
$9348	Survey/identification chart		-	uc	1	0	0
$9349	Hr number		dl	ul	1	0	0
$9351	Star name in the BSC catalogue		-	uc	25	0	0
$934A	U-B on Johnson system		-	fl	1	0	0
$934B	R-I on johnson system		-	fl	1	0	0
$934C	vsini (Projected rotational velocities) (km/s)		-	uc	5	0	0
$934D	Effective temperature		K	ul	1	0	0
$934E	Quality codes 1		-	uc	10	0	0
$934F	Quality codes 2		-	uc	10	0	0
$9350	Spare		-	uc	28	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$9400	Creation time of the DSR		mjd	mjd	3	0	0
$9401	Quality indicator flag		-	sc	1	0	0
$9402	Identifier of the star in the star catalogue		dl	ul	1	0	0
$9403	Star spectrum		sf	fl	3000	0	0
$9404	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$9501	Number of targets in the Stellar Spectra Databank		dl	us	1	0	0
$9502	Index of the stellar spectrum record versus the GOMOS star i		dl	ss	1024	0	0
$9503	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$9600	Number of input star catalogues		dl	uc	1	0	0
$9601	Filenames of the input star catalogue		-	uc	10	32	0
$9602	Filename of the dark areas list		-	uc	32	0	0
$9603	Spare		-	uc	8	0	0
$9604	Minimum temperature for tracking		K	fl	1	0	0
$9605	Maximum temperature for tracking		K	fl	1	0	0
$9606	Spare		-	uc	8	0	0
$9607	Magnitude threshold for minimum temperature (red stars)		dl	fl	1	0	0
$9608	Magnitude threshold for maximum temperature (blue stars)		dl	fl	1	0	0
$9609	Spare		-	uc	8	0	0
$960A	Maximum angular separation under which a 'double' star is co		deg	fl	1	0	0
$960B	Distance between 2 stars to identify a 'single' or a 'multip		deg	fl	1	0	0
$960C	Magnitude difference between 2 stars to identify a 'single'		dl	fl	1	0	0
$960D	Distance between 2 stars to identify a 'single' or a 'multip		deg	fl	1	0	0
$960E	Magnitude difference between 2 stars to identify a 'single'		dl	fl	1	0	0
$960F	Spare		-	uc	8	0	0
$9610	Maximum brightness variability for a star to be in the GOMOS		%	fl	1	0	0
$9611	Period for maximum variability for a star to be in the GOMOS		s	fl	1	0	0
$9612	Spare		-	uc	8	0	0
$9613	Magnitude detection limit for dark areas		dl	fl	1	0	0
$9614	FOV detection cone radius for dark areas		deg	fl	1	0	0

$9615	Magnitude detection limit for single/double stars	dl	fl	1	0	0
$9616	Spare	-	uc	8	0	0

7.10 Level 2 processing configuration product

Id	Description	Scale	Unit	St	N1	N2	N3
$B201	Standard acceleration of gravity		m.s-2	fl	1	0	0
$B203	Air density in standard conditions of temperature and pressu		kg/m3	fl	1	0	0
$B204	Absolute Reference pressure		Pa	fl	1	0	0
$B205	Avogadro number		mole-1	fl	1	0	0
$B206	Universal gas constant		J/mole/K	fl	1	0	0
$B207	Molecular weight of the dry air		kg/mole	fl	1	0	0
$B208	O2 contribution to air density		dl	fl	1	0	0
$B209	Pressure at the top of the atmosphere		Pa	fl	1	0	0
$B20A	Limit value for the relative variation of density		dl	fl	1	0	0
$B20B	Maximum number of iteration for the iterative process		dl	us	1	0	0
$B20C	Number of GOMOS sources data (used in GAP)		dl	uc	1	0	0
$B20D	Activation flag for GOMOS sources data (GAP)		dl	uc	7	0	0
$B20E	Weight factor on O2 data (used in GAP)		dl	fl	1	0	0
$B20F	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B301	Chromatic refraction mode for the measured transmission		dl	uc	1	0	0
$B302	Chromatic refraction mode for transmission model (*)		dl	uc	2	0	0
$B303	Instrument function mode for the transmission model (*)		dl	uc	2	0	0
$B304	Vertical inversion mode		dl	uc	1	0	0
$B305	Smoothing mode (after the spectral inversion)		dl	uc	1	0	0
$B306	Time mode in the transmission model (*)		dl	uc	2	0	0
$B307	Choice of atmospheric model for SPB (02 and H20 transmission		dl	uc	1	0	0
$B308	Maximum value of the occultation obliquity		deg	fl	1	0	0
$B30A	Spare		-	uc	8	0	0
$B30B	Identifier of Earth model		dl	uc	1	0	0
$B30C	Flattening of the Earth		dl	fl	1	0	0
$B30D	Earth equatorial radius		m	ul	1	0	0
$B30E	Atmosphere thickness		m	fl	1	0	0
$B30F	Spare		-	uc	8	0	0
$B310	Maximum number of iterations for the deviation computation		dl	uc	1	0	0
$B346	Threshold value for the ray deviation computation		deg	fl	1	0	0
$B347	First altitude step for the ray tracing		m	fl	1	0	0
$B348	Altitude step for the ray tracing		m	fl	1	0	0
$B349	Altitude sampling for density second derivative calculation		m	fl	1	0	0
$B34A	Maximum number of iterations for impact parameter computatio		dl	uc	1	0	0
$B34B	Precision for impact parameter computation		m	fl	1	0	0
$B311	Minimum wavelength value for ray-tracing	1.E-03	nm	ul	1	0	0
$B312	Maximum wavelength value for ray-tracing	1.E-03	nm	ul	1	0	0
$B313	Spare		-	uc	8	0	0
$B314	Altitude range for turbulence fluctuations processing		m	fl	2	0	0
$B315	Length of the cross-correlation window		m	fl	1	0	0
$B316	Spare		-	uc	8	0	0
$B317	Number of altitudes for reference line density		dl	uc	1	0	0
$B318	Choice of atmospheric model for SPA (reference line density)		dl	uc	1	0	0
$B34C	Air reference line density computation model		dl	uc	1	0	0
$B319	Total number of species for spectrometer A		dl	uc	1	0	0
$B31A	Number of species groups (initialisation phase)		dl	uc	1	0	0
$B31B	Number of species groups (spectral inversion phase)		dl	uc	1	0	0
$B31C	Number of altitudes for spectral windows		dl	uc	1	0	0
$B31D	Hanning filter cut-off frequency (half extent)		m	fl	1	0	0
$B31E	Time sampling for the time delay computation		ms	fl	1	0	0
$B31F	Air number density at sea level		cm-3	fl	1	0	0
$B34D	Aerosol model selection		dl	uc	1	0	0
$B34E	Order of the polynomial aerosol model		dl	uc	1	0	0
$B320	Aerosol model coefficients		cm-3, dl	fl	2	0	0
$B321	DOAS sliding window size in pixels		dl	us	1	0	0
$B324	Maximum value of chi2 before a warning flag is raised		dl	fl	1	0	0

$B325	Number of atmosphere zones per gas for GOP (max = 10)		dl	uc	10	0	0
$B326	Number of acquisitions per layer for air for GOP		dl	uc	10	0	0
$B327	Number of acquisitions per layer for aerosol for GOP		dl	uc	10	0	0
$B328	Number of acquisitions per layer for O3 for GOP		dl	uc	10	0	0
$B329	Number of acquisitions per layer for NO2 for GOP		dl	uc	10	0	0
$B32A	Number of acquisitions per layer for NO3 for GOP		dl	uc	10	0	0
$B32B	Number of acquisitions per layer for O2 for GOP		dl	uc	10	0	0
$B32C	Number of acquisitions per layer for H2O for GOP		dl	uc	10	0	0
$B32D	Number of acquisitions per layer for OCLO for GOP		dl	uc	10	0	0
$B32E	Spare		-	uc	20	0	0
$B32F	Turbulence parameters		dl,ms,ms	fl	10	0	0
$B330	Lower altitude for aerosol for GOP		m	fl	10	0	0
$B331	Lower altitude for O3 for GOP		m	fl	10	0	0
$B332	Lower altitude for NO2 for GOP		m	fl	10	0	0
$B333	Lower altitude for NO3 for GOP		m	fl	10	0	0
$B334	Lower altitude for O2 for GOP		m	fl	10	0	0
$B335	Lower altitude for H2O for GOP		m	fl	10	0	0
$B336	Lower altitude for OCLO for GOP		m	fl	10	0	0
$B337	Spare		-	uc	80	0	0
$B338	Flag for negative densities in LMA (0=no 1=yes)		dl	ss	1	0	0
$B339	Photometer flag (0=blue 1=red) - scintillation processing		dl	ss	1	0	0
$B33A	Minimum value for transmission terms		dl	fl	1	0	0
$B33B	Maximum value for transmission terms		dl	fl	1	0	0
$B33C	Minimum value for optical thickness		dl	fl	1	0	0
$B33D	Maximum value for optical thickness		dl	fl	1	0	0
$B33E	Minimum value for column densities		cm-2	fl	1	0	0
$B33F	Maximum value for column densities		cm-2	fl	1	0	0
$B340	Minimum value for local densities		cm-3	fl	1	0	0
$B341	Maximum value for local densities		cm-3	fl	1	0	0
$B342	Maximum altitude for H2O retrieval		m	fl	1	0	0
$B343	Scale factor (spectral inversion) for the elements of the co		dl	sc	1	0	0
$B344	Scale factor (vertical inversion) for the elements of the co		dl	sc	1	0	0
$B345	Spare		-	uc	16	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B401	Number of altitudes for all convergence criteria (*)		dl	uc	1	0	0
$B402	Maximum number of iterations for the main loop		dl	uc	1	0	0
$B403	Maximum number of iterations for the inversion process		dl	uc	1	0	0
$B404	Maximum number of iterations for the spectral inversion of S		dl	uc	1	0	0
$B405	Maximum number of iterations for the spectral inversion of L		dl	uc	1	0	0
$B407	Maximum for relative standard deviation evolution		dl	fl	1	0	0
$B408	Spare		-	uc	4	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B500	Creation time of the DSR		mjd	mjd	3	0	0
$B501	Quality indicator flag		-	sc	1	0	0
$B502	Altitude		m	fl	1	0	0
$B503	Convergence criteria for Air in the main loop (local density		cm-3	fl	1	0	0
$B504	Convergence criteria for Air (local density)		cm-3	fl	1	0	0
$B505	Convergence criteria for Aerosols (local density)		cm-3	fl	1	0	0
$B506	Convergence criteria for O3 (local density)		cm-3	fl	1	0	0
$B507	Convergence criteria for NO2 (local density)		cm-3	fl	1	0	0
$B508	Convergence criteria for NO3 (local density)		cm-3	fl	1	0	0
$B509	Convergence criteria for O2 (local density)		cm-3	fl	1	0	0
$B50A	Convergence criteria for H2O (local density)		cm-3	fl	1	0	0
$B50B	Convergence criteria for OClO (local density)		cm-3	fl	1	0	0
$B50C	Spare		-	uc	8	0	0
$B50D	Chi2 criteria value (for LMA)		dl	fl	1	0	0
$B50E	Spare		-	uc	4	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B600	Creation time of the DSR		mjd	mjd	3	0	0
$B601	Quality indicator flag		-	sc	1	0	0
$B602	Altitude		m	fl	1	0	0
$B603	Reference tangent line density for Air		cm-2	fl	6	0	0
$B604	Reference tangent line density for Aerosols		cm-2	fl	6	0	0
$B605	Reference tangent line density for O3		cm-2	fl	6	0	0

$B606	Reference tangent line density for NO2	cm-2	fl	6	0	0
$B607	Reference tangent line density for NO3	cm-2	fl	6	0	0
$B608	Reference tangent line density for O2	cm-2	fl	6	0	0
$B609	Reference tangent line density for H2O	cm-2	fl	6	0	0
$B60A	Reference tangent line density for OClO	cm-2	fl	6	0	0
$B60B	Spare	-	uc	48	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B700	Creation time of the DSR		mjd	mjd	3	0	0
$B701	Quality indicator flag		-	sc	1	0	0
$B702	Inversion method choice (LMA=0, DOAS=1)		dl	uc	1	0	0
$B703	Number of species		dl	uc	1	0	0
$B704	Species list		dl	uc	10	0	0
$B705	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B800	Creation time of the DSR		mjd	mjd	3	0	0
$B801	Quality indicator flag		-	sc	1	0	0
$B802	Inversion method choice (LMA=0, DOAS=1)		dl	uc	1	0	0
$B803	Number of species		dl	uc	1	0	0
$B804	Species list		dl	uc	10	0	0
$B805	Spare		-	uc	8	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$B900	Creation time of the DSR		mjd	mjd	3	0	0
$B901	Quality indicator flag		-	sc	1	0	0
$B902	Altitude		m	fl	1	0	0
$B903	Number of spectral windows for Air		dl	uc	1	0	0
$B904	Spectral window for Air		nm	fl	2	5	0
$B905	Number of spectral windows for Aerosols		dl	uc	1	0	0
$B906	Spectral window for Aerosols		nm	fl	2	5	0
$B907	Number of spectral windows for O3		dl	uc	1	0	0
$B908	Spectral window for O3		nm	fl	2	5	0
$B909	Number of spectral windows for NO2		dl	uc	1	0	0
$B90A	Spectral window for NO2		nm	fl	2	5	0
$B90B	Number of spectral windows for NO3		dl	uc	1	0	0
$B90C	Spectral window for NO3		nm	fl	2	5	0
$B90D	Number of spectral windows for O2		dl	uc	1	0	0
$B90E	Spectral window for O2		nm	fl	2	5	0
$B90F	Number of spectral windows for H2O		dl	uc	1	0	0
$B910	Spectral window for H2O		nm	fl	2	5	0
$B911	Number of spectral windows for OClO		dl	uc	1	0	0
$B912	Spectral window for OClO		nm	fl	2	5	0
$B913	Spare		-	uc	82	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$BA00	Creation time of the DSR		mjd	mjd	3	0	0
$BA01	Quality indicator flag		-	sc	1	0	0
$BA02	Altitude		m	fl	1	0	0
$BA03	Number of spectral windows for Air		dl	uc	1	0	0
$BA04	Spectral window for Air		nm	fl	2	5	0
$BA05	Number of spectral windows for Aerosols		dl	uc	1	0	0
$BA06	Spectral window for Aerosols		nm	fl	2	5	0
$BA07	Number of spectral windows for O3		dl	uc	1	0	0
$BA08	Spectral window for O3		nm	fl	2	5	0
$BA09	Number of spectral windows for NO2		dl	uc	1	0	0
$BA0A	Spectral window for NO2		nm	fl	2	5	0
$BA0B	Number of spectral windows for NO3		dl	uc	1	0	0
$BA0C	Spectral window for NO3		nm	fl	2	5	0
$BA0D	Number of spectral windows for O2		dl	uc	1	0	0
$BA0E	Spectral window for O2		nm	fl	2	5	0
$BA0F	Number of spectral windows for H2O		dl	uc	1	0	0
$BA10	Spectral window for H2O		nm	fl	2	5	0
$BA11	Number of spectral windows for OClO		dl	uc	1	0	0
$BA12	Spectral window for OClO		nm	fl	2	5	0
$BA13	Spare		-	uc	82	0	0

7.11 Cross section database product

Id	Description	Scale	Unit	St	N1	N2	N3
$C201	O3 cross-sections summary description (SPA)		-	uc	20	128	0
$C202	Number of points in the spectral grid		dl	us	1	0	0
$C203	Spectral grid		nm	fl	9001	0	0
$C204	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C301	O3 cross-sections summary description (SPB)		-	uc	20	128	0
$C302	Number of points in the spectral grid		dl	us	1	0	0
$C303	Spectral grid		nm	fl	500	0	0
$C304	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C401	NO2 cross-sections summary description		-	uc	20	128	0
$C402	Number of points in the spectral grid		dl	us	1	0	0
$C403	Spectral grid		nm	fl	9001	0	0
$C404	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C501	NO3 cross-sections summary description		-	uc	20	128	0
$C502	Number of points in the spectral grid		dl	us	1	0	0
$C503	Spectral grid		nm	fl	9001	0	0
$C504	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C601	OCLO cross-sections summary description		-	uc	20	128	0
$C602	Number of points in the spectral grid		dl	us	1	0	0
$C603	Spectral grid		nm	fl	9001	0	0
$C604	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C701	O2 transmisssions summary description		-	uc	20	128	0
$C702	Number of models		-	us	1	0	0
$C703	Number of points in the spectral grid		-	us	1	0	0
$C704	Spectral grid		nm	fl	2700	0	0
$C705	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C801	H2O transmisssions summary description		-	uc	20	128	0
$C802	Number of models		-	us	1	0	0
$C803	Number of points in the spectral grid		-	us	1	0	0
$C804	Spectral grid		nm	fl	2700	0	0
$C805	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$C900	Creation time of the DSR		mjd	mjd	3	0	0
$C901	Quality indicator flag		-	sc	1	0	0
$C902	Temperature associated to DSR		K	fl	1	0	0
$C903	O3 cross sections (SPA)		cm2	fl	9001	0	0
$C904	Errors		dl	fl	8	4	0
$C905	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CA00	Creation time of the DSR		mjd	mjd	3	0	0
$CA01	Quality indicator flag		-	sc	1	0	0
$CA02	Temperature associated to DSR		K	fl	1	0	0
$CA03	O3 cross sections (SPB)		cm2	fl	500	0	0
$CA04	Errors		dl	fl	8	4	0
$CA05	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CB00	Creation time of the DSR		mjd	mjd	3	0	0
$CB01	Quality indicator flag		-	sc	1	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CB02	Temperature associated to DSR		K	fl	1	0	0
$CB03	NO2 cross sections		cm2	fl	9001	0	0
$CB04	Errors		dl	fl	8	4	0
$CB05	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CC00	Creation time of the DSR		mjd	mjd	3	0	0
$CC01	Quality indicator flag		-	sc	1	0	0
$CC02	Temperature associated to DSR		K	fl	1	0	0
$CC03	NO3 cross sections		cm2	fl	9001	0	0
$CC04	Errors		dl	fl	8	4	0
$CC05	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CD00	Creation time of the DSR		mjd	mjd	3	0	0
$CD01	Quality indicator flag		-	sc	1	0	0
$CD02	Temperature associated to DSR		K	fl	1	0	0
$CD03	OCLO cross sections		cm2	fl	9001	0	0
$CD04	Errors		dl	fl	8	4	0
$CD05	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CE00	Creation time of the DSR		mjd	mjd	3	0	0
$CE01	Quality indicator flag		-	sc	1	0	0
$CE02	Altitude associated to DSR		m	fl	1	0	0
$CE03	Column density		cm-2	fl	6	0	0
$CE04	02 transmissions		dl	fl	62700	0	
$CE05	Systematic error		%	fl	6	0	0
$CE06	Random error (3 sigma)		dl	fl	6	0	0
$CE07	Spare		-	uc	64	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$CF00	Creation time of the DSR		mjd	mjd	3	0	0
$CF01	Quality indicator flag		-	sc	1	0	0
$CF02	Altitude associated to DSR		m	fl	1	0	0
$CF03	Column density		cm-2	fl	6	0	0
$CF04	H2O transmissions		dl	fl	62700	0	
$CF05	Systematic error		%	fl	6	0	0
$CF06	Random error (3 sigma)		dl	fl	6	0	0
$CF07	Spare		-	uc	64	0	0

7.12 Meteo product

Id	Description	Scale	Unit	St	N1	N2	N3
$F200	Start time of the Data Set Record		mjd	mjd	3	0	0
$F201	Data quality indicator		-	sc	1	0	0
$F202	Local O3 density		cm-3	fl	1	0	0
$F203	Standard deviation for the local O3 density	1.E-01	%	us	1	0	0
$F204	Local NO2 density		cm-3	fl	1	0	0
$F205	Standard deviation for the local NO2 density	1.E-01	%	us	1	0	0
$F206	Local NO3 density		cm-3	fl	1	0	0
$F207	Standard deviation for the local NO3 density	1.E-01	%	us	1	0	0
$F208	Local air density		cm-3	fl	1	0	0
$F209	Standard deviation for the local air density	1.E-01	%	us	1	0	0
$F20A	Local O2 density		cm-3	fl	1	0	0
$F20B	Standard deviation for the local O2 density	1.E-01	%	us	1	0	0
$F20C	Local H2O density		cm-3	fl	1	0	0
$F20D	Standard deviation for the local H2O density	1.E-01	%	us	1	0	0
$F20E	Local OClO density		cm-3	fl	1	0	0
$F20F	Standard deviation for the local OClO density	1.E-01	%	us	1	0	0
$F210	PCD summary		dl	uc	12	0	0
$F211	Spare		-	uc	12	0	0

Id	Description	Scale	Unit	St	N1	N2	N3
$F600	Start time of the measurement		mjd	mjd	3	0	0

$F601 Attachement flag		dl	uc	1	0	0
$F603 Latitude of the spacecraft (*)	1.E-06	deg	sl	1	0	0
$F602 Longitude of the spacecraft (*)	1.E-06	deg	sl	1	0	0
$F604 Altitude of the spacecraft (*)	1.E-02	m	ul	1	0	0
$F606 Latitude of the tangent point (*)	1.E-06	deg	sl	1	0	0
$F605 Longitude of the tangent point (*)	1.E-06	deg	sl	1	0	0
$F607 Altitude of the tangent point (*)	1.E-02	m	ul	1	0	0
$F609 Error on the latitude of the tangent point (*)	1.E-07	deg	sl	1	0	0
$F608 Error on the longitude of the tangent point (*)	1.E-07	deg	sl	1	0	0
$F60A Error on the altitude of the tangent point (*)	1.E-03	m	ul	1	0	0
$F60B Tangent point atmospheric pressure (from external model)		Pa	fl	1	0	0
$F60C Tangent point temperature (from external model)		K	fl	1	0	0
$F60D Local air density from GOMOS atmospheric profile		cm-3	fl	1	0	0
$F60E Standard deviation for the local air density	1.E-01	%	us	1	0	0
$F60F Local temperature		K	fl	1	0	0
$F610 Standard deviation for the local temperature	1.E-01	%	us	1	0	0
$F611 PCD summary		dl	uc	1	0	0
$F612 Spare		-	uc	8	0	0

8. Appendix C - Examples

Note: several examples described below make calls to xmgrace plotting tool which must be available. **Grace** is a WYSIWYG 2D plotting tool for the X Window System and M*tif. Grace runs on practically any version of Unix. This free software may be downloaded from the following web adress:

http://plasma-gate.weizmann.ac.il/Grace/

Anyway, as the output of the GOMOS toolbox programs are ASCII files any plotting tool such as gnuplot may be used in place of xmgrace.

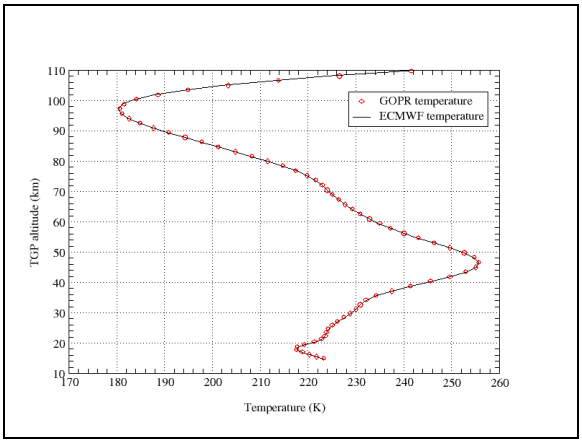
8.1 Temperature profiles from level 2 product

Script:

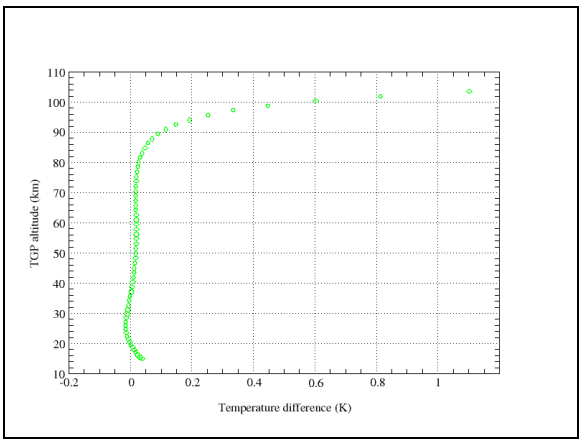
```
#!/bin/sh

#-------------------------------------------------------------------------
#
# Extract the temperature profile computed by GOPR and extracted from ECMWF
# and computes their difference
#
# Syntax:
#
#    plot_temp_lv2.sh level2.prd
#
# gb : 25/01/01 : initial version
#
#-------------------------------------------------------------------------

# file is the product name
FILE=$1

# extract all the needed data from the level 2 product
display_pr 3 $FILE 3607 360C 360F > zzz.dat

# extract the altitudes
extract_pr zzz.dat 3607 1 REAL MDS -1 > alt.dat
# convert form m into km
awk '{print $1/1000.}' < alt.dat > tempfile
cp tempfile alt.dat

# extract the ECMWF temperatures
extract_pr zzz.dat 360C 1 REAL MDS -1 > ecmwf_temp.dat

# extract the GOPR temperatures
extract_pr zzz.dat 360F 1 REAL MDS -1 > gopr_temp.dat
```

```
# build the two data files
paste ecmwf_temp.dat alt.dat > ecmwf_plot.dat
paste gopr_temp.dat alt.dat > gopr_plot.dat

# compute the difference between the two temperature profiles
paste gopr_temp.dat ecmwf_temp.dat > diff.dat
awk '{print $1-$2}' < diff.dat > diff_temp.dat
paste diff_temp.dat alt.dat > diff_plot.dat

# at the end of this script:
# ecmwf_plot.dat contains the ECMWF temperature profile vs TGP altitude
# gopr_plot.dat contains the GOPR temperature profile vs TGP altitude
# diff_plot.dat contains the difference between these two profiles vs altitude
```

Graphic of ecmwf_plot.dat and gopr_plot.dat:



Graphic of diff_plot.dat:

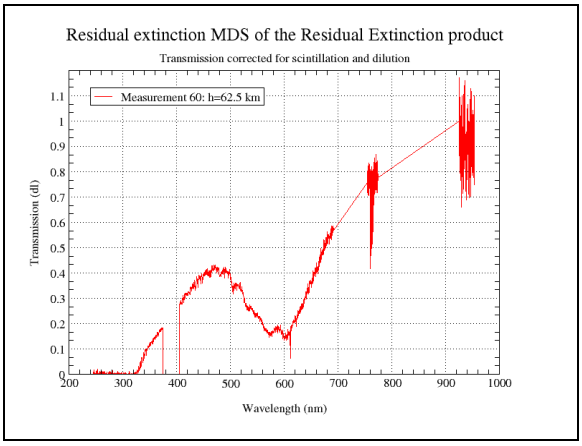


8.2 Temperature corrected from scintillation and dilution from Residual Extinction product versus altitude

Script:

```
#! /bin/sh
#
# Script to extract the extinction parameters from the residual extinction
product
#

FICIN=res_ext.prd

# Code of the transmission corrected from scintillation and dilution
CODE=4302

# Extract the needed data from the product
display_pr 4 $FICIN 4201 $CODE > tcorr.dat

# Extract the wavelength assignment from the ascii file
extract_pr tcorr.dat 4201 2336 REAL GADS -1 > wl.dat

# Extract the transmission from the ascii file
extract_pr tcorr.dat $CODE 2336 REAL MDS 60 > trans.dat

# Build a single file from the two column files
paste wl.dat trans.dat > plot.dat
```

Graphic of plot.dat:

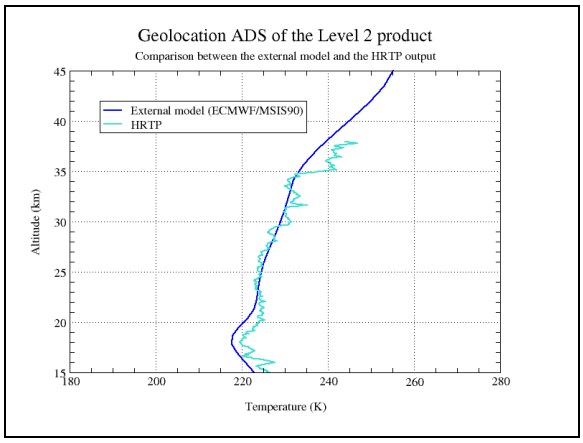


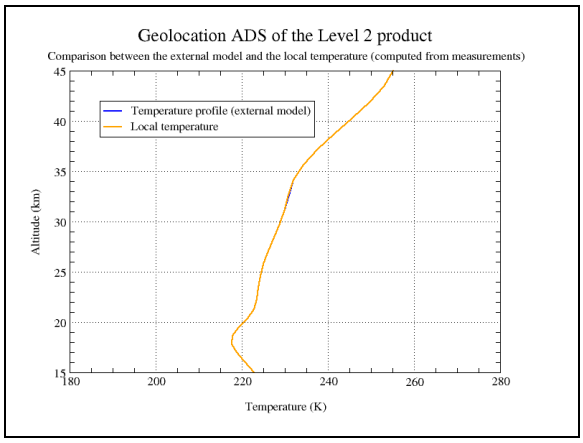
8.3 ECMWF temperature profile versus HRTP and GOPR profile

Script:

```
#! /bin/sh
#
# Script to plot the atmosphere parameters from the level 2 product
#

FICIN=level2.txt
display_pr 3 level2.prd 360C 360F 3503 3502 3607 > $FICIN

#
#----- Temperature profile (external model) vs HRTP -----
#
CODE=360C
extract_pr $FICIN $CODE 1 REAL MDS -1 > zzz1
extract_pr $FICIN 3607 1 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz2 > zzz3
paste zzz1 zzz3 > zzz2
CODE=3503
extract_pr $FICIN $CODE 20 REAL MDS -1 > zz1
extract_pr $FICIN 3502 20 REAL MDS -1 > zz2
awk '{print $1/1000.}' < zz2 > zz3
paste zz1 zz3 > zz2

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_temp.gif"
xmgrace $HDEV $HARD $FILE zzz2 zz2 -batch plot_temp.xmgr

#
#----- Temperature profile (GOMOS) vs external model -----
#
CODE=360C
extract_pr $FICIN $CODE 1 REAL MDS -1 > zzz1
extract_pr $FICIN 3607 1 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz2 > zzz3
paste zzz1 zzz3 > zzz2
CODE=360F
extract_pr $FICIN $CODE 1 REAL MDS -1 > zz1
extract_pr $FICIN 3607 1 REAL MDS -1 > zz2
awk '{print $1/1000.}' < zz2 > zz3
paste zz1 zz3 > zz2

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_temp2.gif"
xmgrace $HDEV $HARD $FILE zzz2 zz2 -batch plot_temp2.xmgr
```

Graphics generated using xmgrace:





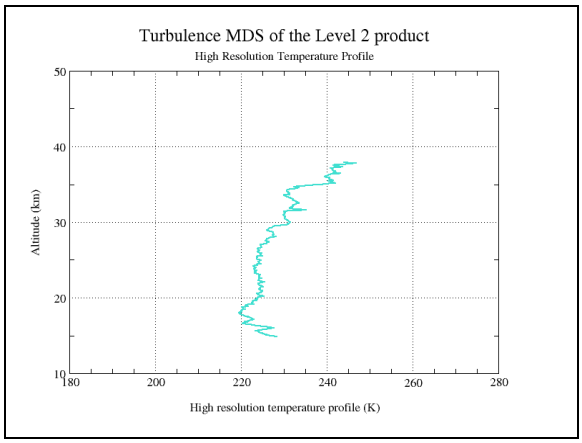
8.4 HRTP results

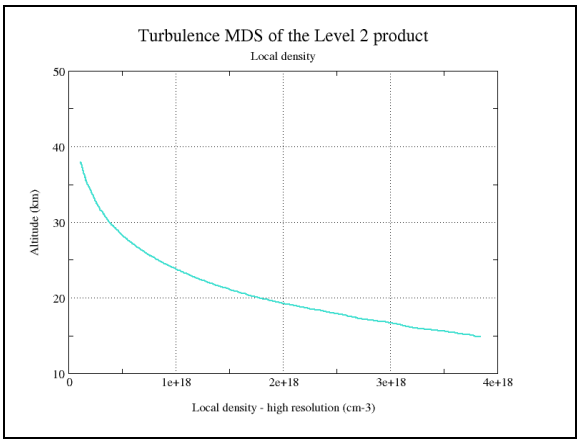
Script:

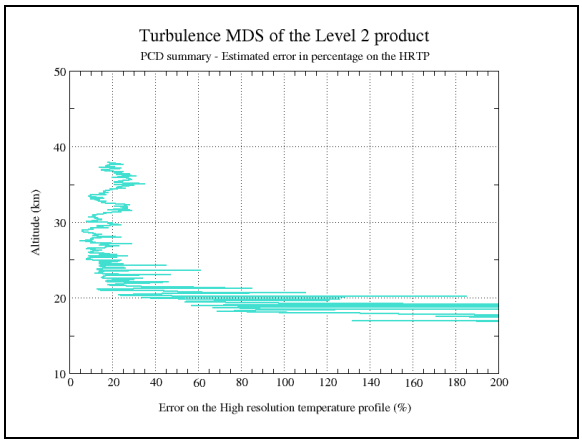
```
#! /bin/sh
#
# Script to plot the HRTP parameters from the level 2 product
#

FICIN=level2.txt
display_pr 3 level2.prd 3503 3504 3502 3505 > $FICIN

#
#----- HRTP -----
#
CODE=3503
extract_pr $FICIN $CODE 20 REAL MDS -1 > zzz1
extract_pr $FICIN 3502 20 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz2 > zzz3
paste zzz1 zzz3 > zzz2

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz2 -batch plot_$CODE.xmgr

#
#----- Local density -----
#
CODE=3504
extract_pr $FICIN $CODE 20 REAL MDS -1 > zzz1
extract_pr $FICIN 3502 20 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz2 > zzz3
paste zzz1 zzz3 > zzz2
```

```
HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz2 -batch plot_$CODE.xmgr

#
#----- PCD summary for HRTP -----
#
CODE=3505
extract_pr $FICIN $CODE 20 INT MDS -1 > zzz1
extract_pr $FICIN 3502 20 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz2 > zzz3
paste zzz1 zzz3 > zzz2

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz2 -batch plot_$CODE.xmgr
```

Graphics generated using xmgrace:







8.5 Extinction coefficients

Script:

```
#! /bin/sh
#
# Script to extract the extinction parameters from the level 2 product
#

FICIN=level2.txt
display_pr 3 level2.prd 3402 3607 3403 3406 3407 > $FICIN

#
#----- extinction coefficient -----
#
CODE=3402
extract_pr $FICIN 3607 1 REAL MDS -1 > zzz1
extract_pr $FICIN $CODE 1 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz1 > zzz3
paste zzz2 zzz3 > zzz1

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz1 -batch plot_$CODE.xmgr

#
#----- standard deviation of the extinction coefficient -----
#
CODE=3403
extract_pr $FICIN 3607 1 REAL MDS -1 > zzz1
extract_pr $FICIN $CODE 1 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz1 > zzz3
paste zzz2 zzz3 > zzz1

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz1 -batch plot_$CODE.xmgr

#
#----- tangent integrated extinction profile (optical thickness) -----
#
CODE=3406
extract_pr $FICIN 3607 1 REAL MDS -1 > zzz1
extract_pr $FICIN $CODE 1 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz1 > zzz3
paste zzz2 zzz3 > zzz1

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz1 -batch plot_$CODE.xmgr
```

```
#
#----- standard deviation of the extinction coefficient -----
#
CODE=3407
extract_pr $FICIN 3607 1 REAL MDS -1 > zzz1
extract_pr $FICIN $CODE 1 REAL MDS -1 > zzz2
awk '{print $1/1000.}' < zzz1 > zzz3
paste zzz2 zzz3 > zzz1

HARD="-hardcopy"
HDEV="-hdevice GIF"
FILE="-printfile plot_$CODE.gif"
xmgrace $HDEV $HARD $FILE zzz1 -batch plot_$CODE.xmgr
```

Graphics generated using xmgrace: