

CHAMP

Overhauser Magnetometer Data Description (CDF)

CH-ME-2-OVM

Update: *Martin Rother*
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1) Naming Conventions

Each filename is build as

CH-ME-2-OVM+<YYYY>-<MM>-<DD>-hh-mm-ss.sss[-<sector>]-<sensor>-<version>.cdf

<i><YYYY></i>	<i>four digits with year</i>						
<i><MM></i>	<i>two digits with month of year</i>						
<i><DD></i>	<i>two digits with day of month</i>						
<i><hh></i>	<i>two digits with hour</i>						
<i><mm></i>	<i>two digits with minute</i>						
<i><ss.sss></i>	<i>£5.2 format with second</i>						
<i><sector></i>	<i>optional single character to identify orbit-sector (polar or equatorial), if missing, it's only one file per day.</i> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><i>a</i></td> <td><i>north polar</i></td> </tr> <tr> <td><i>b</i></td> <td><i>south polar</i></td> </tr> <tr> <td><i>c</i></td> <td><i>equatorial</i></td> </tr> </table>	<i>a</i>	<i>north polar</i>	<i>b</i>	<i>south polar</i>	<i>c</i>	<i>equatorial</i>
<i>a</i>	<i>north polar</i>						
<i>b</i>	<i>south polar</i>						
<i>c</i>	<i>equatorial</i>						
<i><sensor></i>	<i>ID of FGM-sensor used to correct S/C-fields, in [1, 2].</i>						
<i><version></i>	<i>product version number, an integer ≥ 1.</i>						

2) Tabulated overview

<i>Global Option/NETWORK_ENCODING</i>		
<i>Name</i>	<i>Typ</i>	<i>Description</i>
<i>Global/gAttributes</i>		
PRODUCT	CDF_CHAR	<i>Product Name</i>
TITLE	CDF_CHAR	<i>Title/Name of data-set</i>
HISTORY	CDF_CHAR	<i>Modification/Creation info</i>
MJD2000	CDF_INT4	<i>Modified Julian Day (2000) of first vector</i>

GPS_TM_START	CDF_INT4	GPS time of first vector
MSEC_O_START	CDF_INT4	offset to GPS start time in 1/10 milliseconds
GPS_TM_END	CDF_INT4	GPS time of last vector
MSEC_O_END	CDF_INT4	offset to GPS end time in 1/10 milliseconds
NR_OF_RECORDS	CDF_INT4	Number of Records
<i>Global/vAttributes</i>		
INFO, HEADS, VALIDMIN, VALIDMAX, SCALEMIN, SCALEMAX, UNIT, FORMAT, SYSTEM, MODEL, REFRADIUS, SYSTEM, INFO		
<i>Data Record/rVariables</i>		
GPS_TM	CDF_INT4	GPS time word
MSEC_O	CDF_INT2	offset to GPS time in 1/10 milliseconds
GEO_LAT	CDF_REAL8	Latitude, geocentric geographic, in degree
GEO_LON	CDF_REAL8	Longitude, geocentric geographic, in degree
GEO_ALT	CDF_REAL8	Altitude above reference sphere, in km
QUALITY	CDF_BYTE	Quality
B_TOTAL	CDF_INT4	Scalar magnetic field value in 1/100 nT
<i>Data Record/zVariables</i>		

3) Meaning of the Bits in the Quality Information

(corrected 1.Feb.2001)

Bit(s) Nr. [0..7]	Mask	Comment
0	1	If set, gps flag 'Pulse Sync Reached' is not true, which is derived from CH-OG-1-HK-THK hk data set. In this case monitored OVM quartz frequency (found in CH-ME-1-OVM-HK) is ironed heavily.
1	2	If set, gps/scef flag in OVM derived status bit, given in CH-ME-1-OVM as entry status (stored in bit 1) is false. In this case the monitored OVM quartz frequency is ironed.
2	4	Indicates missing overlap with HK data information. Isolated events should not harm data quality significantly.
3	8	Indicates that no FGM data is available simultaneously. Corrections will be incomplete.
4	16	Indicates missing regular positions (usable, but less precise)
5	32	Indicates periods with other time confusions (less serious)
6	64	Indicates invalid position values, probably NaN's

It is recommended to categorise data as bad if any flag is on, but data marked by bits 1 or 4 only (flagging less

serious errors) can be still usable for some purposes.

4) CDF Skeleton

```
! Skeleton table for the "ch-me-2-ovm" CDF.
! Generated: Monday, 3-Sep-2001 05:00:16
! CDF created/modified by CDF V2.6.4
! Skeleton table created by CDF V2.6.4
```

```
#header
```

```
                CDF NAME: ch-me-2-ovm
DATA ENCODING: NETWORK
MAJORITY: ROW
                FORMAT: SINGLE
```

```
! Variables  G.Attributes  V.Attributes  Records  Dims  Sizes
! -----  -
!          7/0           9           11         0/z     0
```

```
#GLOBALattributes
```

```
! Attribute      Entry      Data      Value
! Name           Number     Type
! -----
"PRODUCT"        1:        CDF_CHAR  { "CH-ME-2-OVM" } .
"TITLE"          1:        CDF_CHAR  { "CHAMP ME OVM" } .
"HISTORY"        1:        CDF_CHAR  { "Version: 00-Apr-14" } .
"MJD2000"        1:        CDF_INT4  { 0 } .
"GPS_TM_START"   1:        CDF_INT4  { 12345678 } .
"MSEC_O_START"   1:        CDF_INT4  { 0 } .
"GPS_TM_END"     1:        CDF_INT4  { 87654321 } .
"MSEC_O_END"     1:        CDF_INT4  { 0 } .
"NR_OF_RECORDS" 1:        CDF_INT4  { 1000 } .
```

```
#VARIABLEattributes
```

```
"INFO"
```

```
"UNIT"
"FORMAT"
"VALIDMAX"
"VALIDMIN"
"SCALEMAX"
"SCALEMIN"
"REFRADIUS"
"SAMPLE"
"SYSTEM"
"MODEL"
```

```
#variables
```

```
! Variable      Data      Number      Record      Dimension
! Name          Type      Elements    Variance    Variances
! -----      ----      -
```

```
"GPS_TM"      CDF_INT4      1      T
```

```
! Attribute      Data
! Name          Type      Value
! -----      ----      -
```

```
"INFO"      CDF_CHAR      { "GPS time word" }
"UNIT"      CDF_CHAR      { "in s" }
"FORMAT"    CDF_CHAR      { "I10" }
"VALIDMIN"  CDF_INT4      { 0 } .
```

```
! RV values were not requested.
```

```
! Variable      Data      Number      Record      Dimension
! Name          Type      Elements    Variance    Variances
! -----      ----      -
```

```
"MSEC_O"      CDF_INT2      1      T
```

```
! Attribute      Data
! Name          Type      Value
! -----      ----      -
```

```
"INFO"      CDF_CHAR      { "offset to full GPS second" }
"UNIT"      CDF_CHAR      { "in 1/10 ms" }
"FORMAT"    CDF_CHAR      { "I10" }
"VALIDMIN"  CDF_INT4      { -9999 } .
```

```
! RV values were not requested.
```

```
! Variable      Data      Number      Record      Dimension
! Name          Type      Elements    Variance    Variances
! -----      ----      -
```

```
"GEO_LAT"      CDF_REAL8      1      T
```

```
! Attribute      Data
! Name           Type           Value
! -----      -
```

```
"INFO"         CDF_CHAR      { "Latitude" }
"UNIT"         CDF_CHAR      { "in degree" }
"FORMAT"       CDF_CHAR      { "F20.10" }
"VALIDMIN"    CDF_INT4      { 90 }
"SYSTEM"       CDF_CHAR      { "geocentric geographic" } .
```

```
! RV values were not requested.
```

```
! Variable      Data      Number      Record      Dimension
! Name          Type      Elements    Variance    Variances
! -----      -
```

```
"GEO_LON"     CDF_REAL8     1      T
```

```
! Attribute      Data
! Name           Type           Value
! -----      -
```

```
"INFO"         CDF_CHAR      { "Longitude" }
"UNIT"         CDF_CHAR      { "in degree" }
"FORMAT"       CDF_CHAR      { "F20.10" }
"VALIDMAX"    CDF_INT4      { 360 }
"VALIDMIN"    CDF_INT4      { -360 }
"SYSTEM"       CDF_CHAR      { "geocentric geographic" } .
```

```
! RV values were not requested.
```

```
! Variable      Data      Number      Record      Dimension
! Name          Type      Elements    Variance    Variances
! -----      -
```

```
"GEO_ALT"     CDF_REAL8     1      T
```

```
! Attribute      Data
! Name           Type           Value
! -----      -
```

```
"INFO"         CDF_CHAR      { "Altitude above reference sphere" }
"UNIT"         CDF_CHAR      { "in m" }
"FORMAT"       CDF_CHAR      { "F20.10" }
"VALIDMIN"    CDF_INT4      { 0 }
"REFRADIUS"   CDF_REAL4     { 6371.2 }
"SYSTEM"       CDF_CHAR      { "geocentric geographic" } .
```

! RV values were not requested.

! Variable ! Name ! -----	Data Type ----	Number Elements -----	Record Variance -----	Dimension Variances -----
---------------------------------	----------------------	-----------------------------	-----------------------------	---------------------------------

"QUALITY"	CDF_BYTE	1	T	
-----------	----------	---	---	--

! Attribute ! Name ! -----	Data Type ----	Value -----
----------------------------------	----------------------	----------------

"INFO"	CDF_CHAR	{ "Data quality, zero indicates lack of " - "known problems " }
"FORMAT"	CDF_CHAR	{ "A" } .

! RV values were not requested.

! Variable ! Name ! -----	Data Type ----	Number Elements -----	Record Variance -----	Dimension Variances -----
---------------------------------	----------------------	-----------------------------	-----------------------------	---------------------------------

"B_TOTAL"	CDF_INT4	1	T	
-----------	----------	---	---	--

! Attribute ! Name ! -----	Data Type ----	Value -----
----------------------------------	----------------------	----------------

"INFO"	CDF_CHAR	{ "Scalar magnetic field" }
"UNIT"	CDF_CHAR	{ "in 1/100 nT" }
"FORMAT"	CDF_CHAR	{ "I10" } .

! RV values were not requested.

#zVariables

! No zVariables.

#end