

WIND-WAVES DATA in Meudon

X.Bonnin, S.Hoang, B.Cecconi, QN.Nguyen
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1. DATA ACCESS, ORGANIZATION & STRUCTURE

1.1. DATA ACCESS

Data and products are stored on the mac os 10.8.0 server **waves.obspm.fr** in the directory **/nfs/wind/Data/WIND_Data**. Access to this server requires a user account.

1.2. DATA ORGANIZATION

1.2.1. RAW AND ANCILLARY DATA

Wind/Waves raw and ancillary data files can be found in the directory **/waves**, which contains the following subdirectories:

- /Summary_Plots Waves data summary plots (ps format)
- /lz Waves raw data files (binary format)
- /wind_kp Key parameters files for Wind instruments.
- /wind_oa Wind ancillary data files (orbit, attitude, spin)

1.2.2. CDPD DATA PRODUCTS

The directory **/CDPD** contains the data products to be archived in the CDPD¹. A subdirectory has been created for RAD1 and RAD2 receivers (**/rad1** and **/rad2**).

Each subdirectory contains the following folders:

- /l1 Level 1 data products
- /l2 Level 2 data products (calibrated)
 - average 60-seconds averaged data
 - background background data (receiver)
 - h_res high resolution data
- /l3 Level 3 data products (Flux density, goniopolarimetry, direction-finding, quasi-thermal noise, etc.)
- /ps Plots in ps format
- /pdf Plots in pdf format
- /status Receiver mode summary files (ascii format)

Additional/plots folder contains the following data products:

- /pit Intensity time profile archives
- /spd Dynamical spectrum archives

1.3. DATA STRUCTURE

1.3.1. LEVEL 2 PRODUCTS

L2 intensity values are calibrated in $\mu\text{V}^2/\text{Hz}$ at the receiver and subtracted from the receiver background.

- Structure of one record of l2 high resolution data:

```
l2_hres = {data_WIND_Waves_hres, $
  receiver_code:0b, $ ; receiver index (1=Rad1, 2=Rad2)
  irecord:0l, $ ; record index
  isweep:0l, $ ; sweep index
  ical:0b, $ ; calibration flag (1=cal, 0=no cal)
  ianten:0b, $ ; antenna mode index (1=SUM MODE, 0=SEP MODE)
  channel:'', $ ; channel name ('S'=SUM, 'SP'=SUM_PRIME, 'Z'=Z)
  sweep_sec:0., $ ; Time in sec. since begin of current sweep
```

¹ <http://cdpp.eu/>

```
seconds:dblarr(3), $ ; Time in sec. since begin of current day
                    (i.e., 00:00:00 UTC) for channels [S, SP, Z].
freq:0.,           $ ; Frequency in kHz
intensity:fltarr(3)} ; Intensity in  $\mu\text{V}^2/\text{Hz}$  for channels [S, SP, Z]
```

- Structure of one record of 12 60 seconds averaged data:

```
l2_avg = {data_WIND_Waves_60s, $
receiver_code:0b, $ ; receiver index (Rad1=1, Rad2=2)
irecord:01,      $ ; record index
isweep:01,      $ ; sweep index
seconds:0.,     $ ; time in sec. since begin of the current day
                (i.e., 00:00:00 UTC)
freq:0.,        $ ; frequency in kHz
intensity:0.}   ; intensity in  $\mu\text{V}^2/\text{Hz}$  in the S channel.
```

1.3.2. LEVEL 3 PRODUCTS

TBW

2. DATA PROCESSING

2.1. SOFTWARE TO PROCESS DATA

The RAD1 and RAD2 data products are processed on the server **waves.obspm.fr** using the WAPITI software (Waves Pipeline at LesIa).

The WAPITI source files are available in <https://gitlab.obspm.fr/Wind/WAPITI> (contact xavier.bonnin@obspm.fr for an access).

The production instance of WAPITI is stored in the directory */nfs/wind/Software/WAPITI*.

2.2. SOFTWARE TO READ DATA

2.2.1. WITH IDL

WAPITI includes IDL routines to read RAD1/RAD2 data. They can be found in:

WAPITI/src/dataproduct/read_data

→ To read a Rad1 or Rad2 high resolution data file from IDL:

```
IDL>data = read_wind_waves_hres(hres_file, header)
```

→ To read a Rad1 or Rad2 60 seconds averaged data file from IDL:

```
IDL>data = read_wind_waves_60s(60s_file, header)
```

Waves data can also be loaded with the *get_waves_data.pro* routine, providing the date and the name of the receiver as input arguments :

```
IDL>data = get_waves_data(date, receiver, level=level, header=header)
```

By default this program returns 12 high-resolution data, but other data set are available using the *level* keyword parameter.

In each case, the outputs *data* are IDL structure arrays containing data records as defined in Section 1.3. Optional outputs “*header*” are also structure arrays providing the sweep headers.

2.2.2. PYTHON LIBRARY

MASER4PY Python 3 package includes few modules to read Wind/Waves data.

See <https://pypi.org/project/maser4py/> for more details.