Instrument specific keyword value hints

Matheus Guilherme Brito - 2022-04-20 - Comments (0) - Phase 3 FAQs

Q: Could you please provide some information regarding the format of APEX 1-D spectra?

A: The format defined in the Phase 3 SDPS for 1-D spectral products applies also in the case of APEX reduced spectra, with few modifications:

1. The following keyword defined as mandatory for spectral products do not apply in the case of APEX spectra: OBID1.

2. While the keyword FEBE1 indicating the Frontend-backend combination becomes mandatory in this case.

Example of the values of some specific keywords:

Primary header

```
ORIGIN  = 'APEX'             / Facility
TELSCOP = 'APEX-12m'         / Telescope name I
NSTRUME= 'APEXHET'          / Instrument name
FEBE1   = 'HET230-XFFTS2'    / Frontend-backend combination
OBSTECH = 'SPECTRUM'         / Technique of observation
PRODCATG= 'SCIENCE.SPECTRUM' / Data product category
```

Extension header

```
EXTNAME = 'SPECTRUM'           / FITS Extension name
TTYPE1  = 'FREQ    '           / Label for field 1
TUTYP1  = 'Spectrum.Data.SpectralAxis.Value'
TUNIT1  = 'GHz     '           / Physical unit of field 1
TUCD1   = 'em.freq '           / UCD of field 1
TDMIN1  =              229.011 / Start in spectral coord.
TDMAX1  =            233.000  / Stop in spectral coord.
TTYPE2  = 'FLUX    '           / Label for field 2
TUTYP2  = 'Spectrum.Data.FluxAxis.Value'
TUNIT2  = 'mJy     '           / Physical unit of field 2
TUCD2   = 'phot.flux.density;em.freq' / UCD of field 2
TTYPE3  = 'ERR     '           / Label for field 3
TUTYP3  = 'Spectrum.Data.FluxAxis.Accuracy.StatError'
TUNIT3  = 'mJy     '           / Physical unit of field 3
TUCD3   = 'stat.error;phot.flux.density;em.freq' / UCD of field 3
```

Please also note that the values of the following keywords need to be provided in nm:

```
WAVELMIN=        1291867.18750 / [nm] Minimum wavelength
```

It corresponds to the value of TDMIN1 converted from GHz to nm (conversion factor: 299792458)

```
WAVELMAX=        1309075.80566 / [nm] Maximum wavelength
```

It corresponds to the value of TDMAX1 converted from GHz to nm (conversion factor: 299792458)

```
SPEC_BIN=        111.744273793 / [nm] Wavelength bin size
SPEC_VAL=        1300471.49658 / [nm] Mean Wavelength
SPEC_BW =        17208.6181641 / [nm] Bandpass Width Wmax – Wmin
```

The following link may be useful to reconstruct the provenance information, it provides the mapping between the original file name to the archive id, and calculating the exposure time:
http://archive.eso.org/wdb/wdb/eso/apex_origfile/form

Q: What shall I do in the case of GTC data?

A: The origin keywords shall be set as follows:

```
ORIGIN = 'GRANTECAN'
TELESCOP = 'GTC'
INSTRUME = 'CANARICAM' or 'OSIRIS'
```

In addition to the above keywords, the use of GTCPRGID and GTCOBID (to be adopted from the original data) is recommended.

Q: Possible algorithm for ABMAGSAT computation

In the case of the VIMOS imaging pipeline, an adaptation of the method used by the PESSTO survey (A&A, 2015, 579, pg. 25) is the following:

ABMAGSAT = zeropoint -2.5*log10(((pi/4.*ln(2)))*(satlev-mean_sky)*(psf_fwhm/pixel_scale)^2)/EFF_EXPT)

where the parameters are those written to the following keywords:

```
satlev = HIERARCH ESO QC SATURATION
zeropoint = HIERARCH ESO QC MAGZPT
mean_sky = HIERARCH ESO QC MEAN_SKY
pdf_fwhm = PSF_FWHM
pixel_scale = HIERARCH ESO QC WCS_SCALE
EFF_EXPT = the effective exposure time (= CASUEXPT)
```

Q: How to compute the MJD-END of a SOFI spectrum?

The end time of a Phase 3 SOFI 1d spectrum product (MJD-END) must be computed using the following formula:

MJD-END = MJD-OBS of the last raw observation + NDIT * (DIT + 1.8) / 86400

where the 1.8 seconds accounts for the necessary overheads, and 86400 scales back from seconds to days.

Q: What is the correct EFFRON for median-combined SOFI images?

Example: There are 7 raw images, each resulting from averaging together 5 detector integrations (NDIT = 5). A science product is generated by reducing and median-combining those 7 raw images.

In this case:

```
EFFRON = 12 * sqrt(PI/2) / sqrt( 7 * 5)
```

where PI is 3.14159, and 12 is the detector readout noise of SOFI in electrons.

Q: May you please clarify what the OBSTECH keyword values are?

A: We support the OBSTECH keywords listed in the table below, in addition to those defined by the SDP standard document.

INSTRUME	Mode		Origin of keyword value	TELESCOP	OBSTECH
OSIRIS	Imaging	Broad band (SDSS filters)			'IMAGE'
		Narrow band (Tunable filters)			'IMAGE,FABRY-PEROT'
		Medium band (SHARDS filters)			'IMAGE'
	Spectroscopy	Long slit	OBSMODE	GTC	'SPECTRUM'
CanariCAM	Imaging				'IMAGE,CHOPNOD' 'IMAGE,NODDING' 'IMAGE,CHOPPING' 'IMAGE,STARE'
	Spectroscopy				'SPECTRUM,CHOPNOD' 'SPECTRUM,NODDING' 'SPECTRUM,CHOPPING' 'SPECTRUM,STARE'

- Tags
- FAQ
- Phase 3

Related Content

- How to convert a spectrum to the required binary table format
- How to migrate catalogues from ASCII to FITS format
- How to rename downloaded products to their original file names
- How to transfer files to the FTP area