



Instrument specific keyword value hints

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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
TELESCOP = '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:

$$\text{MJD-END} = \text{MJD-OBS of the last raw observation} + \text{NDIT} * (\text{DIT} + 1.8) / 86400$$

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:

$$\text{EFFRON} = 12 * \sqrt{\text{PI}/2} / \sqrt{7 * 5}$$

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) | OBSMODE | GTC | 'IMAGE' |
| | | Narrow band (Tunable filters) | | | 'IMAGE,FABRY-PEROT' |
| | | Medium band (SHARDS filters) | | | 'IMAGE' |
| | Spectroscopy | Long slit | | | 'SPECTRUM' |
| CanariCAM | Imaging | | | | 'IMAGE,CHOPNOD' |
| | | | | | 'IMAGE,NODDING' |
| | | | | | 'IMAGE,CHOPPING' |
| | | | | | 'IMAGE,STARE' |
| | Spectroscopy | | | | 'SPECTRUM,CHOPNOD' |
| | | | | | 'SPECTRUM,NODDING' |
| | | | | | 'SPECTRUM,CHOPPING' |
| | | | | | 'SPECTRUM,STARE' |

Tags

FAQ

Phase 3

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