omgrismplot

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Abstract

omgrismplot produces plots of the grism spectrum and background for a FITS file produced by **omgrism** for Optical Monitor observations made with grism-filters.

1 Instruments/Modes

Instrument	Mode
OM	IMAGING

2 Use

pipeline processing	yes
interactive analysis	yes

3 Description

omgrismplotplot produces plots of grism spectra extracted from the OM images taken with the Grism-1 or Grism-2 filters. These plots show spectra (either count rates or flux) and the background count rates. **omgrismplotplot** can be used to display a single spectrum or multiple spectra, produced by **omgrism**.

The input FITS files must contain net count rates, background count rates and the associated errors. The spectra must follow a regular binning scheme (i.e. equispaced wavelength bins).

omgrismplot allows the user to input the device type (e.g. Xwindow, Postscript, ...) for output. The y-scale of the background counts can be forced to be the same as the source counts by setting the parameter 'bkgdyscale' to 'yes'. Otherwise the y-axis is scaled to the most appropriate value for the background counts.

The spectra curves can be rebinned if necessary in order to limit the number of plotted data points to 500.

4 Parameters

This section documents the parameters recognized by this task (if any).

Parameter	Mand	Type	Default	Constraints
set	yes	dataset	No default	

Name of the FITS file containing the spectral data. Case sensitive.

plotdevice	no	String	"/PS"	Constraint : valid device type

Not case sensitive.

plotfile	no	String	"grismplot.ps"	less than 1024 char.

Name of the output file containing the plot. Case sensitive.

binsize	no	Integer	5	Constraint : positive value

scalebkgplot	no	boolean	no	yes/no

To scale the y-axis of the background counts plot to be the same as the y-axis of the plot of the source counts

plotflux	no	Integer	2	0 to 2

Option for plotting spectra as fluxes (in erg/sec/cm^{2}Å) or countrates (in counts/sec/Å)

; 0: plots only countrates, 1: plots only fluxes, 2: plots both coutrates and fluxes

5 Errors

This section documents warnings and errors generated by this task (if any). Note that warnings and errors can also be generated in the SAS infrastructure libraries, in which case they would not be documented here. Refer to the index of all errors and warnings available in the HTML version of the SAS documentation.

Incorrect RATE extension *(error)*
Incorrect `RATE` extensions (see Developer's notes for more details)

Existing output file cannot be overwritten *(error)*
The output file exists, and cannot be overwritten because the SAS_CLOBBER variable is set to 0

Unavailable default device type and/or output file *(error)*
Unavailable default device type and/or output file

Invalid input file *(error)*
Invalid input column dimensions

Unavailable device type and/or output file *(warning)*

corrective action: The device type and output file are set to the defaults.

Number of data points to plot is higher than 500 *(warning)*

corrective action: Increase binsize value until the number of points to plot is lower than 500.

Keywords are missing from the input file *(warning)*
Some header keywords are missing or inconsistent
corrective action: A warning is raised and the task proceeds

6 Input Files

1. OM FITS grism spectra (generated by **omgrism**.

7 Output Files

1. OM Postscript spectra plot (Deliverable PPS product)

8 Algorithm

```
Subroutine omgrismplot

  Recover parameters (File names, Device type, Binning factor, Ouput file)

  Read FITS file :
     Get dataset and table.
     Check important keyword consistency.
     Call a warning or error if necessary.

  Recover all spectra  included in table :

     Net spectra rates and errors & background rates and errors are recorded in arrays
     of dimension Nspectra * Nbins.

  Open plot : create view surface in specified device format (check its validity).

  For each spectrum :

     Delete gaps in data (when the IEEE NaN constant is found).

     Increase binsize if necessary to limit the number of points to 500.

     Rebin rate and error columns by binsize

     Create a labelled plot page separated into two panels in which
     wavelengths are graduated
     on X-axis (see Comments), and count rates (or fluxes) on Y-axis

     Draw net spectrum and background counts on different panels.
```

```
    End for

    Release memory.

    Close plot.

  End subroutine  omgrismplot
```

9 Comments

- Error rates are rebinned following a quadratic scheme (Central limit theorem).
- Wavelength intervals all have the same length.
- The output devices are those of the PGPLOT library. The device list is governed by the drivers available to PGPLOT.

10 Future developments

The parameter `plotflux` to be activated

10.1 CAL usage

- None

References