rgsbkgmodel

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Abstract

Compute a model background spectrum from RGS background templates

1 Instruments/Modes

Instrument	Mode
RGS	Spectroscopy

2 Use

In the interactive environment.

pipeline processing	no
interactive analysis	yes

3 Description

The aim of this package is to compute a model spectrum of the RGS background applicable to a given observation from a combination of observations of empty fields.

Two event files, one per RGS, were built merging 29 observations of empty fields with different levels of background. Due their large size, these files were divided into 16 smaller event files per RGS according to the value of the "Background Level Indicator", hereafter BLI, defined as the countrate of the off-axis region of CCD9:

XDSP_CORR < -3.E-4 rad OR XDSP_CORR > 3.E-4 rad

which corresponds roughly to ± 1 arcmin from the on-axis position.

First and second order spectra were extracted from each event file. These spectra are the templates used to derive the model background spectra.

First, the CCD9 off-axis light curve of the observation is computed. Then, the fraction of the light curve within each of the 16 predefined BLI levels is calculated, and the template spectra are combined weighted

by these fractions. This weighted sum is the model background spectrum for the observation. No further normalization is required.

The only restriction to the use of this task is the compatibility in the binning in beta of the input event file and the templates event files. The latter have been processed with the 'rgsproc' defaults.

For more details on the procedure used to derive the templates, the definition of the BLI and some usage examples, please see Ref. [1]

4 Parameters

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

Parameter	Mand	Type	Default	Constraints
table	yes	table specifier		event list table specifier

A table specifier which must point to a rgs event list table in a data set.

order	no	integer	1	$1 \leq integer \leq 2$

Reflection order to process.

backgroundmodelset	no	string	Model_background.fits	valid file name

The name of the file to which the modeled background list is to be written.

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.

incompatible event file *(error)*
The input event file has beta channels value not equal to 3400.

6 Input Files

1. RGS event list file.

7 Output Files

1. Model background spectra (OGIP-compliant).

8 Algorithm

```
compute the background lightcurve of the problem event file applying
the following selection expression

CCDNR==9 AND (XDSP_CORR < -3.E-4 OR XDSP_CORR > 3.E-4)

From the lightcurve, calculate the fraction of the total time for
each of the pre-defined levels of background.

Compute the background template spectra by weighting each of the
template spectra by the corresponding factor calculated from the
ligthcurve.
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9 Comments

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References

[1] R. Gonzaléz-Riestra. Templates for the RGS Background. Technical Report XMM-SOC-CAL-TN-0058, XMM-SOC, October 2004. Found at the URL: http://xmm.vilspa.esa.es/docs/documents/CAL-TN-0058-1-0.ps.gz.