bin_image

May 4, 2016

Abstract

This task produces binned count rate and count-rate uncertainty images of single observations.

1 Instruments/Modes

Instrument	Mode
EPIC	Imaging

2 Use

pipeline processing	no
interactive analysis	yes

3 Description

bin_image produces binned count rate and count-rate uncertainty images of single observations. It can use either individual exposures or the output of the program *comp* which can merge all of the exposures associated with a single ObsID. For each unmasked and binned pixel, the program will determine the average count rate and the count rate uncertainty. The assumption is that the uncertainty is dominated by the counting statistics and the the systematics of the background modeling.

Warning and requirements: *bin_image* is part of the package *esas*, integrated into SAS, but limited to work within *esas*' data reduction scheme. This is specially true wrt input files structure and names. In particular, *bin_image* assumes that another tasks from the package, like *mos-spectra*, *mos_back*, and if desired *comb* must have been successfully run for the exposures to be used.

4 Parameters

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

Parameter	Mand	Type	Default	Constraints

thresholdmasking	yes	real	0.02	

The scale factor for excluding regions from the smoothing based on a mask image. In the default mode the average exposure is calculated and then any pixel with exposure less than fraction*average value is excluded.

detector	yes	int	0	

Detector selection, 0: combined exposures, 1: MOS, 2: PN.

prefix	yes	string	1S001	

Prefix defining the exposure used, with the `esas` nomenclature, eg. S003 means PN S003 exposure, while 1S002 and 2S003 mean MOS1 S002 and MOS2 S003 exposures, respectively.

elow	yes	int	400	

Low energy for band in eV

ehigh	yes	int	1250	

High energy for band in eV

binning	yes	int	1	

Binning control with `1` for no binning, other integers for binning.

withpartcontrol	yes	bool	yes	

Particle background control, "yes" to subtract the model particle background image.

withsoftcontrol	yes	bool	no	

Soft proton background control, "yes" to subtract the soft proton background image.

withswcxcontrol	yes	bool	no	

Solar wind charge exchange background control, "yes" to subtract the SWCX background image.

withmaskcontrol	yes	bool	no	

Solar wind charge exchange background control, "yes" to subtract the SWCX background image.

mask	yes	dataset	mask.fit	

Mask image file name (defaults to using exposure mask).

clobber	no	boolean	yes	T/F

Clobber existing files?

5   Input Files

Event and exposure images from the exposures, or the combined images, to be binned.

6   Output Files

- `rate-`*elow*`-`*ehigh*`.fits` – The binned count rate image for the selected energy band (*elow* and *ehigh*) of the selected region in sky coordinates.

- `sig-`*elow*`-`*ehigh*`.fits` – The binned count rate uncertainty image for the selected energy band (*elow* and *ehigh*) of the selected region in sky coordinates.

7 Algorithm

8 Comments

References