



bin_image_merge

January 12, 2017

Abstract

This task produces binned count rate and count-rate uncertainty images for merged observations using the output of `merge_comp_xmm`.

1 Instruments/Modes

| Instrument | Mode |
|------------|---------|
| EPIC | Imaging |

2 Use

| | |
|----------------------|-----|
| pipeline processing | no |
| interactive analysis | yes |

3 Description

bin_image_merge produces binned count rate and count-rate uncertainty images for merged observations using the output of the task `merge_comp_xmm`. 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_merge* is part of the package *esas*, integrated into SAS, but (still) limited to work within the *esas* data reduction scheme. This is specially true wrt input files structure and names. In particular, *bin_image_merge* assumes that individual observations have been processed and subsequently mosaicked by the task `merge_comp_xmm`.

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.

| | | | | |
|-----------------|-----|-----|---------|--|
| elowlist | yes | int | 350 800 | |
|-----------------|-----|-----|---------|--|

Low energy for successive bands in eV

| | | | | |
|------------------|-----|-----|----------|--|
| ehighlist | yes | int | 800 1300 | |
|------------------|-----|-----|----------|--|

High energy for successive bands in eV

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|----------------|-----|-----|---|--|
| binning | yes | int | 1 | |
|----------------|-----|-----|---|--|

Binning control with 1 for no binning, 2,4,8,16,32 for binning by 2, 4,8,16,32.

| | | | | |
|------------------------|-----|------|-----|--|
| withpartcontrol | yes | bool | yes | |
|------------------------|-----|------|-----|--|

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

| | | | | |
|------------------------|-----|------|-----|--|
| withsoftcontrol | yes | bool | yes | |
|------------------------|-----|------|-----|--|

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

| | | | | |
|------------------------|-----|------|-----|--|
| withswcxcontrol | yes | bool | yes | |
|------------------------|-----|------|-----|--|

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

| | | | | |
|------------------------|-----|------|-----|--|
| withmaskcontrol | yes | bool | yes | |
|------------------------|-----|------|-----|--|

For masking with an additional image.

| | | | | |
|-------------|-----|---------|----------|--|
| mask | yes | dataset | mask.fit | |
|-------------|-----|---------|----------|--|

Mask image file name.

| | | | | |
|----------------|----|---------|-----|-----|
| clobber | no | boolean | yes | T/F |
|----------------|----|---------|-----|-----|

Clobber existing files?

5 Input Files

The count, exposure, QPB, and SP image products from running `merge.comp_xmm`, following the particular nomenclature used in the `esas` package, eg.: *obj-im-350-800.fits* for a mosaicked image with the first band in that spectral range.

6 Output Files

- **rate-elow-ehigh.fits** – The binned count rate image for the selected energy band (*elow* and *ehigh*) of the of the mosaicked field.
- **sig-elow-ehigh.fits** – The binned count rate uncertainty image for the selected energy band (*elow* and *ehigh*) of the mosaicked field.



7 Algorithm

8 Comments

References