



# bin\_image\_merge

June 2, 2019

## 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
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<b>thresholdmasking</b>	yes	real	0.02	
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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.

<b>elowlist</b>	yes	int	350 800	
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Low energy for successive bands in eV

<b>ehighlist</b>	yes	int	800 1300	
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High energy for successive bands in eV

<b>binning</b>	yes	int	1	
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Binning control with 1 for no binning, 2,4,8,16,32 for binning by 2, 4,8,16,32.

<b>withpartcontrol</b>	yes	bool	yes	
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Particle background control, "yes" to subtract the model particle background image.

<b>withsoftcontrol</b>	yes	bool	yes	
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Soft proton background control, "yes" to subtract the soft proton background image.

<b>withswcxcontrol</b>	yes	bool	yes	
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Solar wind charge exchange background control, "yes" to subtract the swcx background image.

<b>withmaskcontrol</b>	yes	bool	yes	
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For masking with an additional image.

<b>mask</b>	yes	dataset	mask.fit	
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Mask image file name.

<b>clobber</b>	no	boolean	yes	T/F
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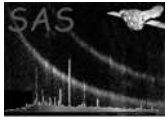
Clobber existing files?

## 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