cheese

June 2, 2019

Abstract

This task creates "cheese" masks after running source detection on full-field images. It uses the SAS task edetect_chain.

1 Instruments/Modes

Instrument	Mode
EPIC	Imaging

2 Use

pipeline processing	no
interactive analysis	yes

3 Description

cheese runs source detection (using the SAS task edetect_chain) on full-field images and creates cheese masks from the output. *cheese* produces the event, exposure, and mask images that are required in a user-selected energy band. Running *cheese* is not required if only the spectral files with all counts including point sources are required, or if excluding point sources is not of interest.

Warning and requirements: *cheese* is part of the *esas* package, integrated into SAS, but it is limited to work within *esas* data reduction scheme. This is specially true wrt the structure and names of the input file structure and names. In particular, *cheese* assumes that other tasks from the package, *mos-filter*, or *pn-filter*, 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

prefixm	yes	string		

Detector and exposure identifiers (eg. "1S001 2S002") for the MOS exposures (in the example MOS1 S001 and MOS2 S002) to be processed.

prefixp	yes	string		

Detector and exposure identifiers (eg. "S003") for the PN exposures (in the example PN S003) to be processed.

verb	yes	int	4	

SAS verbosity level.

scale	yes	real	0.5	

Energy fraction, which sets the exclusion radius of point sources.

rate	no	real	1.0	

Flux threshold (in units of $1.0E-14 cgs$ for the exclusion of point sources.

rates	no	real	1.0	

Flux threshold (in units of $1.0E-14 cgs$ for the exclusion of point sources in the soft band if two bands are selected.

rateh	no	real	1.0	

Flux threshold (in units of $1.0E-14 cgs$ for the exclusion of point sources in the hard band if two bands are selected.

dist	yes	real		

Minimum separation in arc seconds between masked sources.

elow	yes	int	400	

The low energy for the band or bands in eV (e.g., "400" or "400 2000").

ehigh	yes	int	1250	

The high energy for the band or bands in eV (e.g., "1300" or "1300 7200").

rmlmin	no	real	15.0	

Maximum likelihood threshold.

clobber	no	boolean	yes	T/F

Clobber existing files?

5 Input Files

The filtered event files, products from running `mos-filter` or `pn-filter`, following the particular nomenclature used in the *esas* package, eg.: *mos1S001-clean.fits* and *pnS003-clean.fits*.

6 Output Files

`atthk.fits` – SAS attitude file.
`boxlist.fits` – The output from the first pass of *eboxdetect*.
`boxlist-f.fits` – The output from the second pass of *eboxdetect*.
`emllist.fits` – The output from *emldetect*.

Where MOS data are processed:

- `mos`*prefix*`-bkg_region-det.fits` – The background region file made from the filtered source list. Note that this list excludes the sources and is in detector coordinates.
- `mos`*prefix*`-bkg_region-sky.fits` – The background region file made from the filtered source list. Note that this list excludes the sources and is in sky coordinates.
- `mos`*prefix*`-cheese.fits` – The cheese mask image for the *prefix* exposure.

Where PN data are processed:

- `pn`*prefix*`-bkg_region-det.fits` – The background region file made from the filtered source list `mode=2`. Note that this list excludes the sources and is in detector coordinates.
- `pn`*prefix*`-bkg_region-sky.fits` – The background region file made from the filtered source list `mode=2`. Note that this list excludes the sources and is in sky coordinates.
- `pn`*prefix*`-cheese.fits` – The cheese mask image for the *prefix* exposure.

7 Algorithm

8 Comments

References