



# multiespecget

January 27, 2025

## Abstract

Creation of source and background spectra and associated ARF/RMF for multiple event lists

## 1 Instruments/Modes

Instrument	Mode
EPIC MOS	IMAGING
EPIC PN	IMAGING

## 2 Use

pipeline processing	no
interactive analysis	yes

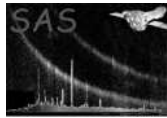
## 3 Description

**multiespecget** is a **especget** wrapper. This task has as input a set of EPIC event lists and a source and background expression in (RA,DEC) and it runs **especget** for each of the input files, producing a set of spectra, responses and effective area files. In the current implementation the source and background regions should both be simple circles.

The **withmultiEPICspec** allows users to run **epicspeccombine** task to combine all the output files, spectra, responses and effective area, into a three individual files: source and background spectra and response files.

The procedure to combine the spectra files and the effective area and response matrices files it is explained in the SAS thread: “Combining the spectra of the 3 EPIC cameras”

[http://xmm.esac.esa.int/sas/current/documentation/threads/epic\\_merging.shtml](http://xmm.esac.esa.int/sas/current/documentation/threads/epic_merging.shtml)



## 4 Usage and Examples

### 4.1 Example 1: Producing EPIC-pn and EPIC-MOS spectra

```
multiespecget tables='m1_evts.ds m2_evts.ds epn_evts.ds' srcexp='(RA,DEC)
in circle(187.879,64.236,0.0166)' backexp='(RA,DEC) in
circle(187.843,64.201,0.02)' calindexsets='ccf.cif ccf.cif ccf.cif'
```

This call produces spectra from MOS-1, MOS-2 and EPIC-pn event files using a circular extraction region of radius 0.0166 degrees. It also produces background spectra and the ARF and RMF matrices for each camera.

### 4.2 Example 2: Combining EPIC data into one spectrum

```
multiespecget tables='m1_evts.ds m2_evts.ds epn_evts.ds' srcexp='(RA,DEC)
in circle(187.879,64.236,0.0166)' backexp='(RA,DEC) in
circle(187.843,64.201,0.02)' calindexsets='ccf.cif ccf.cif ccf.cif'
withmultiEPICspec=yes
```

In addition to the files for the individual instruments, this command produces a single source spectrum, background spectrum, and response matrix representing the combined data from the three cameras. The spectra and matrices are weighted by their exposure time.

## 5 Parameters

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

Parameter	Mand	Type	Default	Constraints
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<b>tables</b>	yes	tables specifier		event lists table specifier
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A set of tables specifier which must point to an event list table in a data set. It must be in either of the forms **setname** or **setname:tableid** where **setname** must be the name of an existing data set and **tableid** the name of a table in the specified data set. If the first form, **setname**, is used, the event data are sought in the *first* block of the named data set.

<b>calindexsets</b>	no	e		
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List of ccf files.

<b>srcexp</b>	yes	string		
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Expression of a circular region for extracting the source events.

<b>backexp</b>	yes	string		
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Expression of a circular region for extracting the background events.



<b>expression</b>	no	string		valid filter expression according to <b>selectlib</b> syntax rules
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This is the expression controlling the filtering process.

<b>onlysingleevents</b>	no	boolean	no	
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Whether to create spectra only for single events.

<b>withmultiEPICspec</b>	no	boolean	no	
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Whether to combine all the output spectra (src and bkg) in one file and combine responses and effective area files into one file.

## 6 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.

### **pairing** (*error*)

The number of events files does not match the number of calibration index files; there must be a one-to-one pairing.

### **SAS.CCF\_Failed** (*error*)

Error trying to change the SAS\_CCF environment variable

### **ProductExtractionFailure** (*error*)

Spectral product accumulation failure (error running **especget**).

## 7 Input Files

- 1.

## 8 Output Files

1. Source spectrum with name RRR\_OOOOOOOOOO\_IIIIEEEE\_src.ds where RRR is the revolution number, OOOOOOOOOO is the observation number, IIII is the instrument name (e.g. EMOS1) and EEEE is the exposure number (e.g. S014).



2. Background spectrum with name RRR\_OOOOOOOOOO\_IIIIEEEE\_bgd.ds
3. ARF with name RR\_OOOOOOOOOO\_IIIIEEEE\_src.arf
4. RMF with name RR\_OOOOOOOOOO\_IIIIEEEE\_src.rmf
5. Optionally produce combined spectra with the names, epic\_spc\_src.ds and epic\_spc\_bkg.ds and a combined ARF and RMF called epic\_rsp.ds

## 9 Algorithm

## 10 Comments

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## References