



exanalyser

January 12, 2017

Abstract

Decide whether an exposure should be analysed in the pipeline

1 Instruments/Modes

Instrument	Mode
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2 Use

pipeline processing	yes
interactive analysis	no

3 Description

Within the XMM pipeline it is necessary to make a decision *a priori* whether a given exposure in an observation should be passed through the normal “scientific” pipeline.

The task will be called once for each and every exposure in an XMM observation, as the very first step in the pipeline analysis. It will provide a simple “go/no go” indication to the pipeline control system (PCMS) whether the exposure is suitable for passing to the standard pipeline analysis. This decision is based solely on information readily available from the ODF (via the OAL), for example instrument mode, filter wheel position (except RGS), exposure duration, etc.

Where exposures are to be ignored by the PCMS, the task will generate an error. This will return a non-zero exit status to the PCMS, which can then act on this signal and proceed no further with the analysis of the exposure.

Exposures rejected by **exanalyser** do not become “invisible”, within the pipeline. Data for the unanalysed exposures will be available for use by pipeline tasks should this be required (eg. MOS offset/variance data exposures). Furthermore output from the summary tasks will still contain information on the unanalysed exposures.

The current baseline is for **exanalyser** to *reject* the following exposures:



- EPIC MOS or pn exposures which are not in a supported mode (see list below)
- EPIC MOS or pn exposures which are not in a supported filter (see list below)
- RGS exposures which are not in a supported mode (see list below)
- OM exposures which are not in a supported mode (see list below)
- OM exposures which are not in a supported filter (see list below)
- Exposures less than 100 seconds in duration

Other, more subtle conditions will doubtless develop as we gain experience with in-flight XMM data. These extra conditions will be added to exanalyser as they are developed.

In the current version, only the exposure duration condition is implemented, pending an upgrade to the OAL to read IPPVs. More functionality will be available once the OAL upgrade is available.

EPIC MOS supported modes	Prime full window, Prime partial RFS, Prime partial W2, Prime partial W3, Prime partial W4, Prime partial W5, Prime partial W6, Fast mode uncompressed
EPIC pn supported modes	Prime full window, Prime large window, Prime small window, Fast mode timing, Fast mode burst
OM supported modes	OM science user defined, EPIC M1 image, EPIC M1 image/fast, EPIC M2 image, EPIC M2 image/fast, EPIC pn image, EPIC PN image/fast, RGS1 image, RGS1 image/fast, RGS2 image, RGS2 image/fast, OM image, OM image/fast
RGS supported modes	Spectroscopy baseline, Spectroscopy + Q, HER, HER with SES, HER with SER, HTR single CCD, HTR multiple CCD
EPIC supported filters	Open, Thin1, Thin2, Medium, Thick
OM supported filters	V, Magnifier, U, B, White, Visible grism, UVW1, UVM2, UVW2, UV grism 1, Barred-U

4 Parameters

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

Parameter	Mand	Type	Default	Constraints
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instrument	yes	string		One of EMOS1, EMOS2, EPN, RGS1, RGS2, OM
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Instrument name

exposureid	yes	integer		> 1
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Exposure identifier within an observation



5 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.

noExposure (*error*)

Exposure with specified ID cannot be found

badFilter (*error*)

Exposure should not be analysed (unknown or disallowed filter)

badMode (*error*)

Exposure should not be analysed (contains data from unknown or disallowed modes)

badDuration (*error*)

Exposure should not be analysed (exposure duration below threshold)

6 Input Files

1. ODF summary file (via OAL)

7 Output Files

None.

8 Algorithm

```
subroutine exanalyser
```

```
    Check instrument/exposure ID match up
```

```
    Read instrument mode (via OAL)
```

```
    Read filter (via OAL)
```

```
    Read exposure duration (via OAL)
```

```
    Check exposure duration
```

```
    Check instrument mode
```

```
    Check instrument filter
```

```
end subroutine exanalyser
```



9 Comments

- The task as described relies on the OAL being able to return the instrument mode (as distinct from the data mode) for an exposure. If the OAL cannot be used as the source of this information, the task will have to read the IPPVs from the summary file directly.

10 Future developments

References