ommag

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Abstract

Converts from count rates to magnitudes in the instrumental system.

1 Instruments/Modes

Instrument	Mode
OM	FAST
OM	IMAGING

2 Use

pipeline processing	yes
interactive analysis	yes

3 Description

This task converts the 'list' of given counts to magnitudes in the appropriate instrumental bandpasses. The 'list' can be a source-list from OMDETECT or a timeseries from EVSELECT or TRCON. The output file will be a FITS file identical to the input source-list or time-series except that the count-rates have been converted into instrumental magnitudes (in the specified filter bandpass - U, B, V, $UVW1$, $UVM2$, $UVW2$, clear) and the new magnitudes written as an extra column in the source-list FITS file. The program also calculates the limiting magnitude and writes the value in the source-list file. Presently the computed magnitude error is the maximum of the two asymmetric ones.

4 Parameters

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

Parameter	Mand	Type	Default	Constraints
set	yes	string	none	

OM OSW Source List filename

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.

Negative Count-Rate *(warning)*
: There were <n> instances of negative count-rate
corrective action:

Bad File Type *(fatal)*
: Could not find any compatibile blocks in set <set>

GetFrameTime *(fatal)*
: window%y0+window%dy ¿ 256- can't continue

6 Input Files

1. OM OSW Source List file (taken from OMDETECT).
2. OM ODF Priority Window Data Auxiliary file

7 Output Files

1. Intermediate OM OSW source list (for input in to OMATT).

8 Output Columns modified

1. CORR_RATE - The count rate after the following corrections have been applied;

   1) A further point-spread function correction may be applied, to extrapolate the counts from 12 to 35 pixels (presently only done for UV observations) 2) Correction for dead-time. 3) Correction for the OM sensitivity-degradation. A key-word **TDS_CORR is added to the table to record the correction value.**

2. **CORR_RATE_ERR - The error in the corrected count rates.**

9 Output Columns Added

1. PSF2_CORR - The point-spread function correction that may have been applied to extrapolate the corrected count rate from 12 to 35 unbinned pixels, defined by (corrected counts at 35 pixels / corrected counts at 12 pixels) * 100. This correction is presently only done for the UV filters, where the wings of the psf extend out a long way.

2. MAG The instrumental magnitude computed using the corrected count rate and using the appropriate calibration constants for the filter.
3. MAG_ERR The error in the computed instrumental magnitude.

10 New keywords added

1. CRMAG - The background limiting magnitude.
2. FRAMTIME - The CCD frame-time in milli-seconds.
3. DEADFRAC - The CCD dead-fraction.

11 Algorithm

```
subroutine ommag

   Read in task parameters

   Open OM OSW Source List file

   Read in the detection-limit count rate.

   Read in the source list table extension keywords from the primary header

   Extract the background limiting counts from the SRLLIST binary-table
   extension.
   Convert this to a limiting magnitude.
   Extract coordinates, photometry radii, count rate, count-error rate and
   background counts, for each source, from the SRCLIST binary-table extension

   Open OM ODF Priority Window Data Auxiliary file

   Get the frame time from the OM ODF Priority Window Data Auxiliary file

   Get the ccd mode



   Loop over source list


      For the ultraviolet filters, extraplolate the source count-rate to a
      35-pixel aperture radius. Correct the count-rates for the CCD dead-time.
      Calculate the source  magnitude using  the  corrected count-rate.

   end loop

   Write count rates and magnitudes to SRCLIST extension of OM OSW Source List file
   Add the limiting magnitude and write it to the source-list file.
end subroutine ommag
```

12 Comments

- none

13 Future developments

- Asymmetric errors in the source list need to be implemented

References