omflatfield

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Abstract

Creates a tracking shifted flatfield and applies it to an OM OSW image.

1 Instruments/Modes

Instrument	Mode
OM	FAST
OM	IMAGING

2 Use

pipeline processing	yes
interactive analysis	yes

3 Description

This task creates a tracking shifted flatfield and applies it to an OM OSW Image.

The tracking shifted flatfield is created by extracting a window from the OM In Orbit Flatfield. This window is made slightly bigger than the OM OSW Image to accomodate the tracking shifts of pixels within the In Orbit Flatfield. The window is also oversampled so that incremental tracking shifts may be applied. The resulting oversampled tracking shifted flatfield is rebinned and resized before it is divided into the OM OSW Image and output as a PPS product. The flatfielded OM OSW Image is also output for use in subsequent pipeline tasks.

4 Parameters

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

Parameter	Mand	Type	Default	Constraints
samplefactor	no	integer	1	1-10

Spatial sampling factor for tracking shifts

set	yes	string	none	

OM Image filename

thxset	yes	string	none	

OM Tracking History Data Auxiliary filename

inorbitflatset	yes	string	none	

OM In Orbit Flatfield filename

tsflatset	no	string	none	

OM Flatfield filename

outset	yes	string	none	

OM Flatfielded Image 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.

allocError *(fatal)*
Can't allocate memory for internal array

badFileMode *(fatal)*
Invalid datamode <dataMode> in set <set>

ZERODRIFT *(warning)*
OM tracking history is not present for this exposure so no tracking shifts can be applied
corrective action: No tracking correction will be applied

deAllocError *(warning)*
Failed to release memory for <name>
corrective action:

zeroValuedFlat *(warning)*
One or more elements of the tracking-shifted flat field (usually at the edge) were unexpectedly found to be zero. This is likely to be a sampling effect.
corrective action: Resets zero valued pixels to unity and sets a non-zero value in the quality array

Uniform flatfield *(warning)*
No flatfield correction will be applied to the image
corrective action: The OM flatfield is currently set to unity (see *omflatgen* task documentation) so this warning always appears. This may change in the future. The use of a uniform flatfield is 'unconventional', hence the warning (notification) to the user.

6 Input Files

1. Intermediate OM Image file (taken from OMCOSFLAG).
2. Intermediate OM Tracking History Data Auxiliary file (taken from OMPREP).
3. Intermediate OM In Orbit Flatfield file.

7 Output Files

1. OM PPS Flatfield file.
2. OM Flatfielded Image file (for input in to OMMODMAP).

8 Algorithm

```
subroutine omflatfield
   read in task parameters
   open OM OSW Image file
   determine file type from datamode in primary header
   read in the science window keywords from the primary header
   calculate image binning
   extract window data from MODES binary table extension
   extract OM OSW Image
   open OM Tracking History Data Auxiliary file
   determine file type from datamode in primary header
   extract tracking history data from OMTHX1 binary table extension
   check for poor tracking solution and warn
   extract OM In Orbit Flatfield file
   calculate maximum drift in x and y
   extract localised in orbit flatfield
   oversample localised in orbit flatfield
   loop over tracking frames to construct oversampled tracking shifted flatfield
      loop over discretised tracking steps
```

```
         add shifted oversampled localised in orbit flatfield to oversampled tracking shifted flatfield

      end loop

   end loop

   normalise the summed flatfield

   resize oversampled tracking shifted flatfield

   divide OM OSW Image by tracking shifted flatfield

   resize and rebin OM OSW Image with appropriate binning factors

   create output OM OSW Image file

   create output OM PPS flatfield

end subroutine omflatfield
```

9 Comments

Since no proper flatfields have been made so far, a check is made to see if all the flatfield pixels are unity- if so the input image is not corrected but a warning issued. This saves a considerable amount of computing time.

10 Future developments

References