mssllib

June 2, 2019

Abstract

A library of utilities used by MSSL SAS tasks

1 Instruments/Modes

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Mode</th>
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<tr>
<td>OM</td>
<td>fast</td>
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<tr>
<td>OM</td>
<td>imaging</td>
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2 Description

The following library functions are implemented:

- COPYIMAGE: copies an image from one dataset to another.
- COPYTABLE: copies a table from one dataset to another.
- GETFILTERID: Gets the ID of an OM filter.
- PARSE: Parses a list of comma separated strings into an array of strings and a number of components.
- SORT: sorts a list of real numbers into ascending numerical order.
- READMODES: reads the CCD modes extension of a dataset.
- READHIST: reads a tracking history dataset.
- TMPFILENAME: creates a temporary filename
- REALSAME: tests whether two real numbers are the same to within a tolerance
- OMASTROMCORRECT: Astrometry correction module
- OMUTILITY: Various utility subroutines
- OMPHOTOMETRY: Various photometry subroutines for use by omdetect, omphotom and omsource
- OMSOURCEFLAGS: Various source-flagging subroutines
• omcoinccorr: Various subroutines for doing coincidence-loss correction
• omdistortion: Various subroutines for doing distortion correction
• ommagnitude: Subroutines for computing instrumental magnitudes
• omnumerics: Various numerical algorithms (eg sorting)
• omskybackground: Various subroutines for computing the sky-background.
• omconstants: Stores various constants
• omfunctions: Various mathematical functions
• brent: Contains two function for finding a root of an equation (taken from Numerical Recipes)
• omminum: Program for finding the minimum of a function
• ominterpolate: Various interpolation routines
• leastsquares: Various least-squares routines

3 Notes on individual modules

3.1 omphotometry_mod

3.2 subroutine pointsourcephotometry

1. Added on 03.04.09
2. Purpose to perform aperture photometry using an exposure image.
3. Input parameters
   • exposureConstant The median value of the exposure image that each image pixel has been multiplied by.
   • radius - photometry aperture radius
   • Image (real 32) The 2-d image to be used for the photometry
   • Exposure image (real 32) The 2-d exposure image to be used for the photometry
4. Input/output variables
   • source - On input structure contains the source coordinates and various other parameters computed by omdetect. On output it will have its photometric raw count-rate components set.

3.3 subroutine extendedsourcephotometry

1. Added on 03.04.09
2. Purpose to perform aperture photometry on extended sources using an exposure and background image.
3. Input parameters
• exposureConstant The median value of the exposure image that each image pixel has been multiplied by.

• Image (real 32) The 2-d image to be used for the photometry

• backgroundImage (real 32) The 2-d background image to be used to subtract the background

• Exposure image (real 32) The 2-d exposure image to be used for the photometry

• elevelimage (integer 16) The 2-d image identifying the pixels assigned to each extended source

4. Input/output variables

• source - On input structure contains the source coordinates and various other parameters computed by omdetect. On output it will have its photometric raw count-rate components set.

References