

## **class CutList:**

### **Attributes:**

ad: AD Object  
has\_dq: Boolean  
has\_var: Boolean  
orientation: derived from the ad.dispersion\_axis().  
debug: Boolean. To plot and display data if True.  
nregions: Number of entries in the MDF table.  
log: GemLog log handler.  
cut\_list: List of Cut objects.  
filename: If debug: Set original filename.  
instrument: If debug: Set instrument name.  
wcs: Pywcs object.

CutList provides a holder for the list of Cut objects.

### **method cut\_regions:**

input:  
    self.ad: AD Object  
output:  
    self.cut\_list: List of Cut objects

Loop through the records of the TRACESLI table and create one Cut objects setting the data,dq,and var sections appending it to the list of Cut objects.

### **Method init\_as\_astrodata:**

Input:  
    self.ad: AD object.  
Output:  
    self.wcs: Pywcs object  
    adout: Output AD object with AD phu, MDF and TRACESLI extensions.

Initialize parameters to be used by as\_astrodata.  
Create WCS object (pywcs) from the SCI header. Init AD output with PHU MDF and TRACESLI from input AD.

## **Method as\_astrodata:**

### **Input:**

self.cut\_list: List of Cut objects.

### **Output:**

adout: Output AD object with as many SCI,VAR,DQ sets as the length of cut\_list.

Loop through the cut\_list and form an hdu object for sci,dq and var sections and append to adout. Update keywords EXTNAME= 'SCI' and EXTVER=<slit#> CCDSEC, DISPAXIS, CUTSECT, CUTORDER in the header. Reset WCS information. Reset WCS crpix and crval values to the center of the section.

## **class Cut:**

### **Attributes**

orientation: Orientation.  
has\_dq : Boolean indicating whether input AD has DQ extension.  
has\_var: Boolean indicating whether input AD has VAR extension.  
region: Region coordinates enclosing one slit.  
debug: Boolean to plot and display.  
filename: If debug: Set original FITS filename.  
instrument: If debug: Set instrument name.  
sci\_data: Pixel data section for the cut.  
dq\_section: DQ data section for the cut.  
var\_section: VAR data section for the cut.

Cut provides functionality to cut rectangular sections containing a slit from the SCI frame and clear the area outside the slit. DQ and VAR sections are also cut.

## **Method cut\_out:**

### **Input:**

rec: TRACESLI table record for the current cut  
science: SCI data for the entire frame.  
dq: DQ data for the entire frame. Value is None if not available.  
var: VAR data for the entire frame. Value is None if not available.

### **Output:**

self.sci\_data: science data cut.  
self.dq\_section: DQ data cut.  
Self.var\_section: VAR data cut.

Cut a region enclosing a slit. Each cut is defined by 'region' and the slit in it is defined by the edge fitting functions. The science section is zero out between the rectangle borders

and the slit edge. The DQ section is bitwise ORed with 1.

**Function form\_extn\_wcs:**

**Input:**

scihdr: SCI header from the original FITS

wcs: WCS instance of pywcs

region: coords of the cut.

**Output:**

WCS appended to the sciheader.

Form wcs information for this cut and  
update the header. The original WCS information  
is used to calculate CRVAL1,2 of the center  
of the cut. The CD matrix is unchanged.  
We used PYWCS module for the transformations.