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*AHELP for CIAO 3.4*

## **hrc\_dtfstats**

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### **Synopsis**

Calculate statistics from hrc\_calc\_dead\_time and a GTI

### **Syntax**

```
hrc_dtfstats infile outfile [gtifile] [maincol] [errcol] [chisqlim]
[clobber] [verbose]
```

### **Description**

hrc\_dtfstats computes the variance-weighted mean deadtime factor in an input hrc deadtime factor (dtf1) file and applies a simple chi-square test to the individual deadtime factors in the dtf1 to determine whether the deadtime is variable. The task can optionally use a file containing good time intervals (GTIs) to filter the dead time factor records on the GTI. If a GTI file is provided, dead time records which are not entirely included in GTIs are excluded from the statistics calculations.

This task is normally run as part of Level 1 and Level 2 processing, but users who make new event lists with different filtering criteria may wish to re-run it and use its output to update the DTCOR, LIVETIME, and EXPOSURE keywords in the new event list headers. In this case, the new HRC ONTIME is the sum of the good time intervals that pass the user-supplied filters, and the new LIVETIME is the product of the new ONTIME and the average deadtime factor from hrc\_dtfstats.

### **Example 1**

```
hrc_dtfstats infile="hrcf05925_000N001_dtf1.fits[DTF]"
outfile=all_dtfstats.fits maincol=DTF errcol=DTF_ERR chisqlim=5
gtifile=NONE
clobber=yes verbose=1
```

Compute DTF statistics from all records in the standard dtf1 file. Flag the deadtime factor as variable if the reduced chi-square about the mean is greater than 5.

## Example 2

```
hrc_dtfstats infile="hrcf05925_000N001_dtf1.fits[DTF]"
outfile=my_dtfstats.fits maincol=DTF errcol=DTF_ERR chisqlim=5
gtifile="my_gtis.fits[FILTER]"
clobber=yes verbose=1
```

Compute DTF statistics from those records in the standard dtf1 file which are contained in the user-generated GTI file my\_gtis.fits. Flag the deadtime factor as variable if the reduced chi-square about the mean is greater than 5.

## Parameters

name	type	ftype	def	min	max	reqd	autoname
<u>infile</u>	file	input				yes	
<u>outfile</u>	file	output				yes	yes
<u>gtifile</u>	file		NONE				
<u>maincol</u>	string		DTF				
<u>errcol</u>	string		DTF_ERR				
<u>chisqlim</u>	real		5				
<u>clobber</u>	boolean		no				
<u>verbose</u>	integer		0	0	5		

## Detailed Parameter Descriptions

**Parameter=infile (file required filetype=input)**

### *Input file*

Input file, containing dead time factors for an observation. The input file should be created by the hrc\_calc\_dead\_time task. If the input fits file has more than one extension, the appropriate fits extension should be given, eg. xxx.fits[xxx].

**Parameter=outfile (file required filetype=output autoname=yes)**

### *Output file*

This is a FITS file that contains various statistics determined for the input Dead Time Factors file.

If auto-naming is used (i.e. input to the outfile parameter ends with "."), the output file will have the suffix "\_dtfstats".

**Parameter=gtifile (file default=NONE)**

*File containing GTI to filter on*

Input file containing a GTI subspace. The user would do best to specify the extension which the GTI applies to (usually EVENTS or FILTER), following the DM syntax, eg. xxx.fits[EVENTS] or xxx.fits[FILTER]. The GTI is applied to the dead time factors in the infile, filtering out any records that fall (in part or in full) in a bad time interval. If the user doesn't want filtering applied, they may set the value to none, NONE, or "".

**Parameter=maincol (string default=DTF)**

*Name of the deadtime factor column*

Name of the deadtime factor column in the input file. The name in the output of hrc\_calc\_dead\_time is DTF.

**Parameter=errcol (string default=DTF\_ERR)**

*Name of the deadtime factor error column*

Name of the deadtime factor error column in the input file. The name in the output of hrc\_calc\_dead\_time is DTF\_ERR.

**Parameter=chisqlim (real default=5)**

*Limit for the variability test*

Threshold value for the deadtime factor variability test. If the reduced chi square value is greater than this, then the dead time is determined to be variable.

**Parameter=clobber (boolean default=no)**

*Clobber output file if it exists?*

**Parameter=verbose (integer default=0 min=0 max=5)**

*Debug level*

Range is from 0 (nothing) to 5, which will describe in detail the processing that is occurring.

## Bugs

## See Also

*chandra*

level

*tools*

hrc\_build\_badpix, hrc\_process\_events

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URL:  
[http://cxc.harvard.edu/ciao3.4/hrc\\_dtfstats.html](http://cxc.harvard.edu/ciao3.4/hrc_dtfstats.html)  
Last modified: December 2006