URL: http://cxc.harvard.edu/ciao3.4/download/scripts/index.html
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CIAO 3.4 Contributed Scripts

Introduction

Many data analysis tasks, particularly those that involve a formulaic procedure or many repetitions of a process, can be greatly simplified with scripts. Analysis scripts allow users to extend the functionality of a software package by writing custom "tools" to fit their specific needs. CIAO provides extensive support for the S−Lang scripting language, but shell and Perl scripts can also be used.

The scripts on this page are written and maintained by local CIAO users at the CXC. We provide them here because many users have found them helpful in their data analysis. In addition, scripts are sometimes written to address known problems or limitations of the CIAO software that affect many users. Most of the scripts have an associated analysis thread that explains their use.

We hope you will find these scripts helpful in your own data analysis. However, please be aware that these are *not* official CIAO tools, meaning that they are not fully supported by the CXC. When using one of these scripts, you should always be aware of exactly what the script is doing, as you are responsible for the validity of any scientific results obtained from it. If you find a problem with a script, please notify the CXC Helpdesk so that we can alert the script's maintainer. However, some scripts are no longer maintained by their original author, so we cannot guarantee when or if problems with scripts will be fixed.

Installation

The installation instructions explain how to install the script package (`CIAO_scripts.tar`), as well as how to run individual scripts.

Download the Scripts

CIAO_scripts.tar	Last Updated: 04 Feb 2008	All the scripts listed on this page, packaged for seamless integration with CIAO; see README_CIAO_scripts for more information.

A `VERSION.CIAO_scripts` file is included in the scripts package. This allows you to check if you are working with the newest set of scripts:

```
unix% cat $ASCDS_CONTRIB/VERSION.CIAO_scripts
04 Feb 2008  15:00:55 EST
```

The `VERSION.CIAO_scripts` file is updated when you install a newer scripts package.

History of Changes

Package Version	Script	Changes
04 Feb 2008	add_grating_spectra	Updated to v3.4. Several broken Unix "tail" commands were replaced with the CIAO tool `dmkeypar`.
13 Sept 2007	show_tgain_corr.sl	Updated to version v1.7. The script uses new calibration files released in CALDB 3.4.1.
25 Apr 2007	acis_bkgrnd_lookup	Updated to version v1.12. The script has been updated for use with the new ACIS blank−sky background files released in CALDB 3.4.0. The script is NOT backward−compatible; you must upgrade to CALDB 3.4.0 to use acis_bkgrnd_lookup v1.12. A list of specific changes made is available in the help file ("ahelp acis_bkgrnd_lookup").
	merge_all	Updated to version v3.6. A "[subspace −expno]" filter was added to the dmmerge command. This is needed as a workaround for a problem merging data with different EXPNO ranges. If you intend to create lightcurves binned on exposure number, read the caveat in the help file ("ahelp merge_all").
	show_tgain_corr show_tgain_corr.sl	Updated to version v1.6. The scripts use new calibration files released in CALDB 3.4.0.

The Script Update History has a record of all changes made to the scripts package since the most recent CIAO release.

Scripts included in the Package (by category)

- Introductory
- Data Preparation
- Imaging
- Imaging Spectroscopy
- Grating Spectroscopy
- Sherpa

Introductory

Script	Associated thread(s)	Language	Version	Last update
example1.sl − example12.sl	S−Lang tips help page	S−Lang		23−Oct−2001
	Code and examples of use from ahelp slang tips			

Data Preparation

Script	Associated thread(s)	Language	Version	Last update
acis_bkgrnd_lookup	Using the ACIS "Blank−Sky" Background Files	slsh	1.12	29−Mar−2007
	Find the ACIS "blank−sky" datasets in the CALDB matching your observation; acis_bkgrnd_lookup help page			

acis_set_ardlib	Use Observation−specific Bad Pixel Files	slsh	1.5	21−Jan−2005
	Update `ardlib.par` files to find bad pixel lists; acis_set_ardlib help page			
analyze_ltcrv.sl	Filtering Lightcurves	S−Lang	1.5	25−Jun−2003
	An alternative algorithm for cleaning lightcurves; analyze_ltcrv.sl help file			
lc_clean.sl	Using the ACIS "Blank−Sky" Background Files	S−Lang	1.9	20−Jun−2003
	Clean a lightcurve to match the ACIS "blank−sky" datasets; lc_clean.sl help file			
monitor_photom	Processing ACA Monitor Window Data	slsh	1.0	23−Jun−2005
	Generate a photometric light curve for a Chandra target which was observed using an ACA monitor window; monitor_photom help file			
show_tgain_corr	Why topic: ACIS Time−dependent Gain	slsh	1.6	16−Apr−2007
	Determine the size of the ACIS time−dependent gain adjustment for a given source location; show_tgain_corr help file			
show_tgain_corr.sl	Why topic: ACIS Time−dependent Gain	slsh	1.7	13−Sep−2007
	Called by `show_tgain_corr`. Determine the size of the ACIS time−dependent gain adjustment for a given source location.			

Imaging

Script	Associated thread(s)	Language	Version	Last update
acis_expmap	Detecting Sources in Imaging Observations − Using celldetect	sh	3.3	27−Sep−2005
	Generate ACIS exposure maps for `celldetect` recursive blocking; acis_expmap help file			
color_image	Create A True Color Image	sh	3.0	27−Feb−2001
	Make a color JPG image; color_image help file			
get_sky_limits	Match the Binning of an Image	slsh	1.6	2−Nov−2004
	Find the required binning to match two images; get_sky_limits help page			
merge_all	Use merge_all Script to Compute ACIS Exposure Maps and Fluxed Images; Merging Data from Multiple Imaging Observations	Perl	3.6	11−Apr−2007
	Combine arbitrary number of ObsIDs, create exposure maps and fluxed images; merge_all help page			

mkBgReg.pl, mkSubBgReg.pl	Create an Image of Diffuse Emission	Perl	1.1	11−Oct−2002
	Create a smoothed, exposure−corrected image of diffuse emission; mkbgreg.pl help file and mksubbgreg.pl help file			
spectrum.sl	Calculating Spectral Weights	S−Lang	2.1	11−Jul−2004
	Calculate spectral weights for creating an instrument map using S−Lang; spectrum.sl help file			
sstats.sl	Calculating Statistics of Images	S−Lang	0.4	4−Oct−2001
	Use S−Lang to calculate statistics of images; sstats.sl help file			

Imaging Spectroscopy

Script	Associated thread(s)	Language	Version	Last update
acis_fef_lookup	Extract ACIS Spectra for Pointlike Sources and Make RMFs and ARFs and Step−by−Step Guide to Creating ACIS Spectra (among others)	slsh	1.20	13−Feb−2007
	Find the FITS Embedded Function file for use by mkrmf; acis_fef_lookup help page			
acisspec	Extracting Extended Source Spectra and Responses and Coadding Spectra and Weighted Responses	sh	4.0	07−Feb−2007
	Extract point−like and extended ACIS spectra with weighted responses or coadd acis spectra; acisspec help page			
psextract	Extract ACIS Spectra for Pointlike Sources and Make RMFs and ARFs	sh	4.0	07−Feb−2007
	Extract source and background ACIS spectra for point−like sources and build associated ARFs and RMFs; psextract help page			
regions.sl	Displaying the FEF Regions Covered by a Source	S−Lang	1.2	17−Jul−2003
	Display the FEF regions covered by a source; regions.sl help file			
show_wgt.sl	Weighting ARFs and RMFs: multiple sources	S−Lang	1.2	22−Oct−2001
	Examine the weights file created by `mkwarf`; show_wgt.sl help file			

Grating Spectroscopy

Script	Associated thread(s)	Language	Version	Last update
add_grating_orders	Extract Coadded and Grouped Nth−Order Source & Background Spectra and ARFs	sh	2.2	22−May−2001

	Add positive and negative diffraction orders of a grating PHA spectra and the corresponding ARFs; add_grating_orders help page			
add_grating_spectra	Add Grating Spectra and Average ARFs	sh	3.4	4−Feb−2008
	Add two source and background grating PHA spectra, average the corresponding ARFs, and group the coadded spectrum; add_grating_spectra help page			
fullgarf	Create Grating ARFs for HETG/ACIS−S and LETG/ACIS−S data	sh	4.0.1	12−Feb−2007
	Create a grating ARF for a particular order; fullgarf help page			
tg_bkg	Create PHA Background File for Use in XSPEC	sh	1.1	28−Jul−2005
	Create PHA background file for use in XSPEC; tg_bkg help file			
tg_osort_img	Create an Order−Sorting Image	slsh	0.7	12−Dec−2005
	Create an image that shows the density of events in different orders; tg_osort_img help file			
tg_scale_reg	Measure Grating Dispersion Distance	slsh	1.4	12−Dec−2005
	Display dispersion distance on the sky image of a grating observation; tg_scale_reg help file			

Sherpa

Script	Associated thread(s)	Language	Version	Last update
chart_spectrum.sl	Preparing to Run ChaRT	S−Lang	1.0.1	18−Feb−2004
	Create a source spectrum for input to ChaRT; chart_spectrum.sl help file			
paramest.sl	Computing Confidence Levels	S−Lang	1.12	2−Nov−2004
	Simplify the calculation of confidence levels using a S−Lang interface to the Sherpa parameter−estimation commands; paramest help page			
setplot.sl	Changing the look of Sherpa plots using setplot.sl	S−Lang	1.3	2−Nov−2004
	Simplify configuration of Sherpa plots; setplot help page			
sherpa_plotfns.sl	Fitting FITS Image Data Advanced customization of Sherpa plots	S−Lang	1.29	2−Nov−2004
	• Customize Sherpa plots using S−Lang function hooks as described in ahelp sherpa_plotfns. • Create a radial (circlular or elliptical) profile of a two−dimensional fit; see the help pages for the `plot_rprof()` and `plot_eprof()` functions.			

sherpa_utils.sl	Changing the grouping scheme of a dataset within Sherpa Calculating K−corrections using S−Lang and Sherpa	S−Lang	1.26	2−Nov−2004
	A collection of useful functions for users of *Sherpa*. Includes: • re−grouping spectra within *Sherpa*; • calculating the k−correction of a model; as well as other miscellaneous functions. See ahelp sherpa_utils for more information.			
simspec	Simulating 1−D Data: the S−lang Script simspec	slsh	1.1	9−Feb−2006
	Create and fit a simulated PHA spectrum; simspec help page			

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