



CIAO Documentation

and the *Chandra* Data Archive

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Science Data Systems

Chandra in Pune, October 23-27, 2017

“ahelp” — *AXAF* Help in CIAO



- ▶ CIAO, Sherpa, and ChIPS comes with the command-line “ahelp” system.
- ▶ `ahelp` has corresponding online counterpart, which is updated between software releases.
 - ▶ `cxc.harvard.edu/ciao/ahelp`
 - ▶ `cxc.harvard.edu/sherpa/ahelp`
 - ▶ `cxc.harvard.edu/chips/ahelp`
- ▶ Python-environments also supports document strings, which Sherpa is migrating towards as its primary documentation system.
- ▶ Every component of CIAO has a help text: tools, packages (Sherpa and ChIPS), scripts and Python modules, and concepts (regions, coords, datamodel, etc.).

```
unix% ahelp <toolname>
unix% ahelp <context>
unix% ahelp -c
```

- ▶ In Sherpa and ChIPS, the string must be in quotes:

```
sherpa> ahelp "toolname"
sherpa> ahelp("toolname")
sherpa> help("docstring")
```

Tip: if you run a tool in the default interactive mode, when prompted for a parameter, entering '?' opens the tool's ahelp file

```
unix% dmextract
Input event file (): ?
```

It all starts here: cxc.harvard.edu/ciao

- ▶ forwards to the most recent release version of CIAO
- ▶ version-specific website can be found at: cxc.harvard.edu/ciaoX.Y
- ▶ similar address structure for Sherpa and ChIPS pages:
 - ▶ cxc.harvard.edu/sherpa
cxc.harvard.edu/sherpaX.Y
 - ▶ cxc.harvard.edu/chips
cxc.harvard.edu/chipsX.Y

The screenshot shows the CIAO website interface. At the top, there's a navigation bar with links for CXC HOME, PROPOSER, ARCHIVE, DATA ANALYSIS, INSTRUMENTS & CALIBRATION, and FOR THE PUBLIC. A search bar is located on the right. The main header features the CHANDRA X-RAY OBSERVATORY logo and a Chandra satellite image. Below the header, there's a sidebar with a menu of links: Introduction, Download CIAO, Data Analysis, Documentation, Sherpa (Modeling and Fitting), ChIPS (Plotting Package), Scripting in CIAO, Data Products, PSF Central, and Workshops. The main content area displays the CIAO logo and the title 'Chandra Interactive Analysis of Observations'. A quote is shown: 'from "s'ciavo", "I am your servant" in Venetian dialect'. Below this, there are links for 'WHAT'S NEW | WATCH OUT', 'Quick CIAO links', and 'Related CXC sites'. At the bottom, there are buttons for 'Install CIAO 4.9 & CALDB 4.7.6', 'Subscribe to the CIAO News RSS feed', and 'Subscribe to Chandra/CIAO announcements'. A link to 'Read the CIAO 4.9 release notes' is also provided.

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CIAO

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Read the [CIAO 4.9 release notes](#) for detailed information on this release, including [How CALDB 4.7.6 Affects Your Analysis](#).

latest news about the software,
contributed scripts, CalDB, and
issues

The “What’s New” and “Watch Out” Pages



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What's New for CIAO 4.9

Subscribe to the CIAO News RSS feed

CALDB has been updated to v4.7.6
18 Aug 2017

[CALDB version 4.7.6](#) has been released, with with new time-dependent ACIS Gain (TGAIN) files for February - July 2017 (Epochs 69+70) and updates to the Epochs 67+68 TGAIN files. The "Group G" ACIS blanksky background files for CTI-corrected, non-graded mode observations taken since 2012 have been revised, fixing issues related to a bug in a tool used to generate the background files.

CALDB 4.7.5.1 and CIAO Scripts package 4.9.4 released
20 Jul 2017

[CALDB version 4.7.5.1](#) has been released, with new time- and temperature-dependent CTI correction files for ACIS-S3 and new "Group G" ACIS blanksky background files for CTI-corrected, non-graded mode observations taken since 2012.

Version 4.9.4 of the Contributed Scripts and Modules tarfile has been released; download the updated package from the [Scripts page](#).

Updates have been made to the scripts and module:

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CIAO "Watch Out" Page

[WHAT'S NEW](#) | [WATCH OUT](#)

This page lists *noteworthy* items and issues about the CIAO release. For the full list of known issues please review the:

- [Bug List for CIAO Tools](#)
- [Data Caveats](#)

[SAOImage ds9](#) | [Installing & Starting CIAO](#) | [Analysis](#)

SAOImage ds9 v7.3.2

I am unable to create regions in ds9

Mouse Mode

The ds9 7.3.2 release notes include the following:

The default mouse mode is now NONE and not REGION or POINTER. This prevents unwanted region creation when bringing the DS9 window to the front in most Window managers.

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CIAO Release Notes

- ▶ CIAO release notes are revised whenever a new version or patch of a package is updated.
- ▶ CalDB components are updated periodically, but will vary from one release to the next.
 - ▶ categorized by detector and instrument configuration
 - ▶ describes files changed and affects on tools, analysis type, and threads
 - ▶ since calibrations evolve with time, note the dates calibration files go into effect for the observation
 - ▶ more details on the CalDB can be found at:
`cxc.harvard.edu/caldb`
- ▶ Details of changes to contributed scripts can be seen at:
`cxc.harvard.edu/ciao/download/scripts/history.html`

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CIAO 4.9 Release Notes

Version History

CIAO 4.9 is distributed for the following platforms:

- Linux 64 bit (CentOS 6.8 / Red Hat Enterprise 6)
- Linux 64 bit (Ubuntu 14.04)
- Apple OS X 10.9 (Mavericks)
- Apple OS X 10.10 (Yosemite)
- Apple OS X 10.11 (El Capitan)
- Apple macOS 10.12 (Sierra)

Users can install CIAO with either Python 2.7 or with Python 3.5. Both Python 2.7 and Python 3.5 versions can be installed but must be installed into separate directories.

CIAO is no longer available for 32bit Linux operating systems or for older 64bit Linux machines (CentOS 5 era). CIAO is also no longer available for older versions of OSX (notably 10.6, 10.7, nor 10.8). CIAO 4.7 is still available for users who are unable to upgrade. More details on the [Platform Support page](#).

Notable changes and improvements in CIAO 4.9:

- CIAO pre-built binaries are now provided for a larger number of operating systems: Linux Fedora based systems (such as RedHat, CentOS, Scientific Linux), Linux Ubuntu based systems (such as LinuxMint), and individually for each Apple release: Mavericks, Yosemite, ElCapitan, and Sierra.
- Beta support for Python 3.5. CIAO have been updated to work with either Python 2.7 or with Python 3.5.
- This is primarily a maintenance release: bug fixes, supporting new compilers and [QTS upgrades](#).
- CIAO includes version 7.5 of [SAOImage ds9](#). Users are reminded that they now need to change the Edit mode setting in order to select or create regions in recent versions of ds9. Please see the [watchout](#) page for more information on this.
- [Sherpa](#) has seen: improvements to the WStat statistic, `save_all` function, and internal documentation (the Python docstrings); minor bug fixes; and updated to support Python 3.5. The [XSPEC models](#) have been updated to version 12.9.00. As a reminder, Sherpa is also available as a stand alone system, accessible from the [Sherpa GitHub repository](#) or from the [standalone Sherpa page](#).
- Several tools have been updated. This includes adding support for table as inputs to [dmellipae](#) and expanded comparisons using [cmdiff](#). There have also been various bug fixes.
- There have been several [new scripts released](#) since the CIAO 4.8 release, including: [blankaky](#), [blankaky_image](#), [correct_periscope_drift](#), and [simulate_psf](#).

• [How CALDB 4.7.6 Affects Your Analysis](#)

• [How CALDB 4.7.5.1 Affects Your Analysis](#)

• [How CALDB 4.7.4 Affects Your Analysis](#)

• [How CALDB 4.7.3 Affects Your Analysis](#)

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• [Parameter Files](#)

• [ChIPS](#)

• [Sherpa](#)

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• [Analysis Scripts](#)

• [Python Modules](#)

• [Libraries](#)

• [Environment](#)

• [Documentation](#)

How CALDB 4.7.6 Affects Your Analysis

[CALDB 4.7.6 Release Notes](#) (release 18 August 2017)

ACIS Imaging and Grating Data

- **Time-dependent ACIS Gain (T_GAIN) Files for -120 C Data**

The new, combined [time-dependent ACIS Gain \(\$\tau_{GAIN}\$ \)](#) file for February-April 2017 (Epoch 69) and May-July 2017 (Epoch 70) are introduced. The combined Epochs 67-68 file has also been updated since CALDB 4.7.4. Therefore, the new τ_{GAIN} affects observations taken since 2016 November 01. Other observations are unaffected by these new calibration files.

Users working with ACIS data taken since 2016 November 01 may wish to run `chandra_repro` and `reprocess` the data to improve the T_GAIN calibration. The `DATE-OBS` header



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“Guides”, “Threads”, and “Why” Pages

- ▶ Analysis Guides are a roadmap to broad categories of analysis; organized based on detector and instrument configuration or source morphology, providing links to more detailed documents.
- ▶ Science Threads are the most important document type. Primarily organized based on science analysis categories.
 - ▶ over 150 CIAO and Sherpa threads, designed to teach users the approach and concerns that go along with analysis
 - ▶ all threads begin with a “quick overview” to provide a synopsis, purpose, and ‘when to use’ the thread
 - ▶ updated and added to as needed; look for “new” and “updated” icon tags
- ▶ Why Topics supplement threads with more detailed information.
 - ▶ some topics highlight common pitfalls and nuances in the software
 - ▶ others topics discuss aspects of *Chandra* and the data obtained with it
 - ▶ some of these topics will also discuss why certain science decisions are made, enabling the user to tailor the analysis to a particular dataset

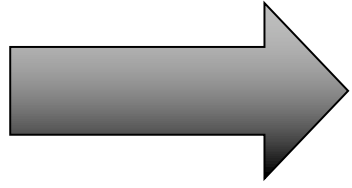


More on Science Analysis Threads

- ▶ Threads are just an example on approaching a problem. Don't blindly follow the examples verbatim, the threads are not strict recipes.
- ▶ Threads answer more detailed issues that may affect science; they help give the details behind the tool itself.
- ▶ An effort in the last few years is to wrap laborious thread analysis steps with a single command-line script.

The image shows a collage of overlapping screenshots from the Chandra X-ray Observatory website. The screenshots display various analysis threads, including:

- Overview**: A thread discussing the tool `srcflux` for generating source counts, energy flux, and background spectra.
- Estimate Source Counts in an Event File**: A thread titled "Estimate Source Counts in an Event File" (CIAO 4.6 Science Threads) that provides a quick method for estimating source counts from event lists or image files.
- Related Links**: Several threads are linked, such as "Analysis of ACIS-QE1 deposition" and "Using the `srcflux` script".
- Contents**: A sidebar menu with options like "Get Started" and "Build Source".



`srcflux` script



The CIAO Gallery of Examples

- ▶ Categorized based on type of manipulation to imaging data.
- ▶ A description of each type of specific manipulation technique.
- ▶ Image included of what the resulting image manipulation returns.

PSF Central

- ▶ Umbrella page unifying the abundance of information about the *Chandra* PSF scattered in the various dictionary, ahelps, threads and why topics in the CIAO and CXC website.
- ▶ Organized by tool; planned to also be organized by scientific question in the future.
- ▶ Includes connection between observation, SAOTrace/ChaRT, and MARX simulations.

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Welcome to PSF Central - CIAO 4.9 - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Welcome to PSF Cen... x +

cx.cfa.harvard.edu/ciao/PSFs/psf_central.html 50% Search

Smithsonian webTA Employee Personal ... CIAO Software Ne... Cfa Event Webcast DS CIAO Main CXC Staff Meetings Astrophysics author...

PSF Central

Understanding the *Chandra* PSF

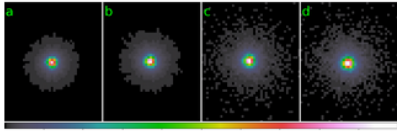
[Modeling the *Chandra* PSF](#) | [Characterizing the *Chandra* PSF](#) | [Using the *Chandra* PSF](#)

The **point spread function (PSF)**, also known as the point response function (PRF), describes the shape and size of the image produced by a delta function (a point) source. This web page collects information and resources about the *Chandra* PSF. **It is a work in progress and we expect to add additional information and links as time goes on.**

Chandra produces sharper images than any other X-ray telescope to date, and therefore, provides an opportunity for high-angular and spectral resolution studies of X-ray sources. Crucial to these studies is the knowledge of the characteristics of the PSF. The observed *Chandra* PSF is smeared with the blur introduced to the High-Resolution Mirror Assembly (HRMA) PSF by a combination of the telescope dithering motion, the limited size of detector pixels, and detector effects (Figures 1 and 2).

At sub-arcsecond scales, the *Chandra* calibration team has identified an optical artifact from the HRMA affecting the PSF, and seen in both ACIS and HRC observations. Details regarding the artifact are available on the [Probing Higher Resolution: an Asymmetry in the *Chandra* PSF](#) caveats page.

Figure 1: HRMA and *Chandra* PSFs



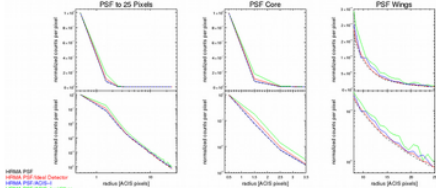
The HRMA PSF produced by ChaRT/SAOTrace at the HRMA focal-plane consisting of all generated rays from the simulation (a). The same HRMA PSF weighted by the probability of the rays reaching the ACIS-I detector-plane (b) as detected by a perfectly uniform detector with 100% quantum efficiency, no contamination on the optical blocking filter and no bad pixels. The *Chandra* PSF is the HRMA PSF smeared and modified by detector effects (c) and spacecraft dithering (d). The spacecraft dither results in sampling multiple detector pixels at each point on the sky, which helps reduce the effects of bad pixels and pileup.

The images are on the same spatial- and logarithmic color-scale. The pixel size in each case is that of the ACIS pixel. The image x- and y-axes are parallel to the spacecraft y- and z-axes, respectively.

Summary of generating image for [Figure 1](#) using an ASCII [spectrum file](#).

[Version: [full-size](#)]

Figure 2: PSF Radial Profiles



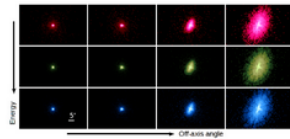
The radial profiles of the PSFs generated in the above figures, all normalized to their respective maximum count (left). The center and right figures show closeups of the PSF core and wings respectively. As expected, the dithered PSF (green) is the broadest profile while the HRMA PSF (black dash) is the narrowest. The PSF with idealized detector geometry effects included (red) is broader than the undithered non-ideal detector (blue) since the core dominates the ideal detector (center) while the PSF wings get many more counts in the non-ideal detector (right). The y-axes are on a linear-scale in the upper-plots and logarithmic-scale for the lower-plots.

Summary of generating [Figure 2](#) and the [region files](#) used to obtain the radial profiles.

[Version: [full-size](#)]

The shape and size of the HRMA PSF varies significantly with source location in the telescope field-of-view (EQU) and the spectral energy distribution of the source (Figure 3). Because of the HRMA's design (nested, Wolter Type I mirrors) and the PSF's dependencies, the image quality is best in a small area centered about the optical-axis. In fact, the mirrors were designed to produce images with 0.5 arcsec resolution and in particular to concentrate >85% of the energy at 0.277 keV within a 1 arcsec diameter (see the [Proposers' Observatory Guide](#)).

Figure 3: HRMA PSF as a Function of Energy and Off-Axis Angle




The shape and size of the HRMA PSF varies significantly with source location in the telescope field of view and spectral energy distribution.

The plot uses simulated PSFs at a set of off-axis angles (0 arcmin, 2.4 arcmin, 4.7 arcmin, and 9.6 arcmin) and mono-chromatic energies (0.92 keV, 1.56 keV, and 3.8 keV) from the CSC soft, medium, and hard bands.

[Version: [full-size](#)]

The appearance of the observed PSF also varies with the number of source photons, particularly at large off-axis angles. Consequently, off-axis sources are frequently misconstrued as extended or having multi-component structure. Users should note that morphological artifacts due to finite counting statistics are apparent, even with a surprisingly large number of total counts, as illustrated in the Figure 4.

Figure 4: Off-Axis PSF Morphology and Source Counts



A simulated 1.49 keV point source, 5 arcmin off-axis. By varying the number of source counts, the apparent morphology is strongly affected.





Sherpa and ChIPS Pages

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Sherpa

CIAO's modeling and fitting package

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Sherpa is the CIAO modeling and fitting application. It enables the user to construct complex models from simple definitions and fit those models to data, using a variety of statistics and optimization methods (see [Gallery of Examples](#)).

Latest Version

Sherpa version for CIAO 4.9 was released on December 16, 2016. Sherpa now runs under Python 2.7 and Python 3.5. The major updates are: the update of the XSPEC models to version 12.9.0; the addition of the `vsstat` statistic, for including a background dataset as a model component (it is based on the XSPEC version); support for background data sets in user statistics created with `load_user_stat`; a major upgrade to the Python docstrings (the `ahelp` pages are still available in this release); and it is the first CIAO release based on the [GitHub-developed version of Sherpa](#). Please consider contributing to Sherpa development, whether by adding code, fixing bugs, or changing documentation.

Sherpa lets you:

- fit 1-D data sets (simultaneously or individually), including: spectra, surface brightness profiles, light curves, general ASCII arrays;
- fit 2-D images/surfaces in the Poisson/Gaussian regime;
- access the internal data arrays;
- build complex model expressions;
- import and use your own models;
- choose appropriate statistics for modeling Poisson or Gaussian data;
- import new statistics, with priors if required by analysis;
- visualize a parameter space with simulations or using 1-D/2-D cuts of the parameter space;
- calculate confidence levels on the best-fit model parameters;
- choose a robust optimization method for the fit: Levenberg-Marquardt, Nelder-Mead Simplex or Monte Carlo/Differential Evolution;
- perform Bayesian analysis with Poisson Likelihood and priors, using Metropolis or Metropolis-Hastings algorithm in the MCMC (Markov-Chain Monte Carlo);
- and use Python to create complex analysis and modeling functions, build the batch mode analysis or extend the provided functionality to meet the required needs.

The Sherpa infrastructure greatly enhances the default Sherpa functions, and provides users with an environment for developing complex and sophisticated analysis.

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ChIPS

The Chandra Imaging and Plotting System

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ChIPS is the imaging and plotting platform for CIAO. It can be used during data analysis - e.g. to plot a lightcurve - and to create publication-quality figures. A range of examples are included in the [ChIPS Gallery](#) and there are a number of [introductory threads](#) to guide beginners.

The CIAO 4.9 release of ChIPS provides support for Python 3.5.

ChIPS is designed for use in a variety of modes: as a user-interactive application - including a GUI - and in batch mode. ChIPS is an importable module for the [Python scripting language](#) and is available as a C/C++ library for software developers.

In interactive mode, undo and redo commands allow the user to easily step forward and backward through previous commands. Users have fine control over the figure display; setting colors, changing font styles, repositioning objects. The many object attributes can be changed at any time during the session, and the change is immediately visible in the ChIPS window. These attribute changes can be made from the command line or from the ChIPS GUI. The default values may also be changed and saved as a preferences files, which can be used in any ChIPS session.

The ChIPS session can be saved into either a platform-independent state file or a Python script. The session can then be restored at any time, even on another machine.

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CXC Home NASA Archives and Centers Astronomy Links iCXC (CXC only) Helpdesk

The Chandra X-Ray Center (CXC) is operated for NASA by the Smithsonian Astrophysical Observatory: 60 Garden Street, Cambridge, MA 02138 USA. Email: chandra@mit.edu

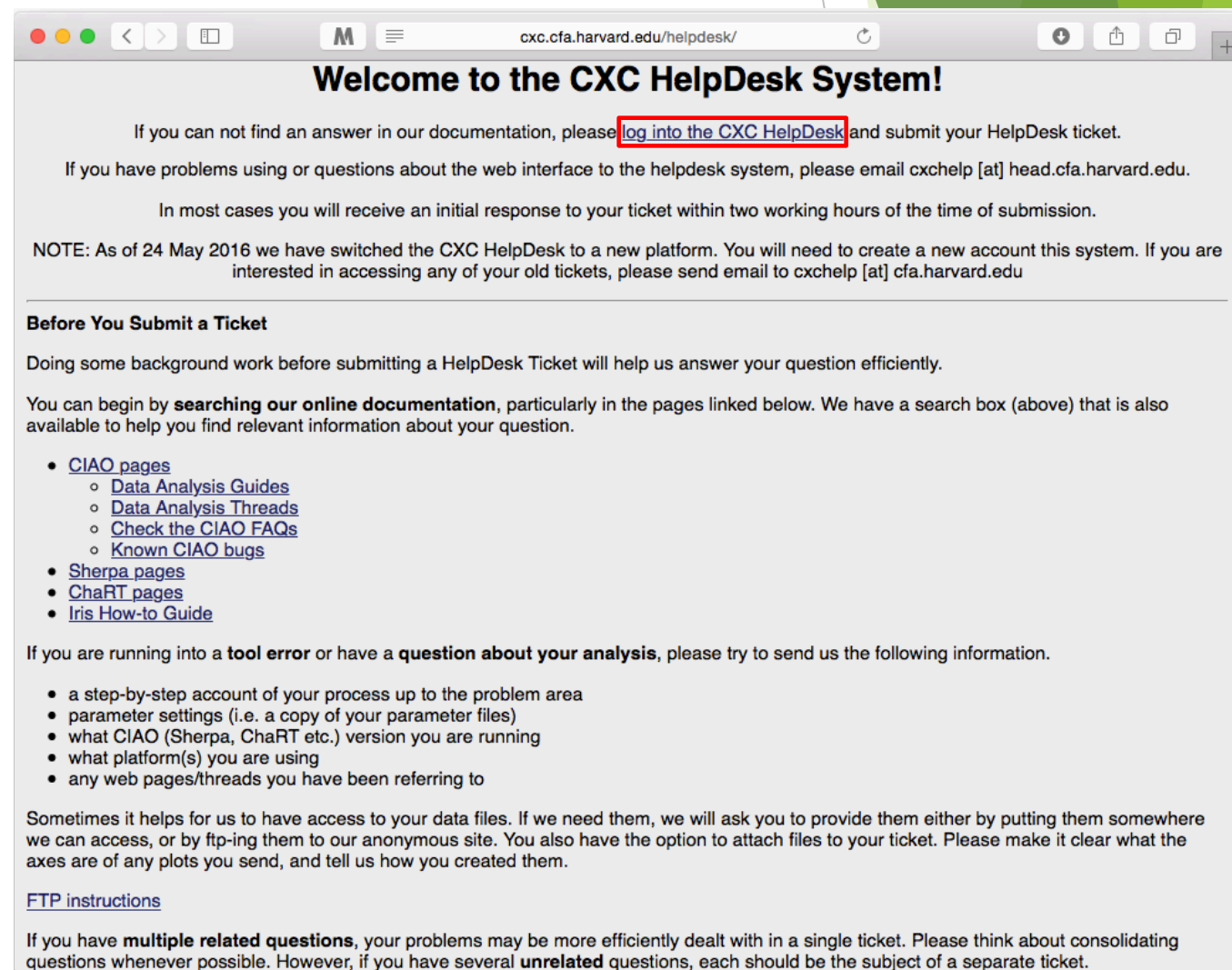
The *Chandra* Helpdesk

cxc.harvard.edu/helpdesk

Provides support for:

- ▶ proposals
- ▶ proposal planning
- ▶ observation scheduling and issues
- ▶ proprietary data
- ▶ data archive
- ▶ data analysis and DS9
 - ▶ help with data processing steps and to understand why they are applied
 - ▶ help highlight and understand the kinds of mistakes that are made during analysis

Chandra in Pune, October 23-27, 2017



Welcome to the CXC HelpDesk System!

If you can not find an answer in our documentation, please [log into the CXC HelpDesk](#) and submit your HelpDesk ticket.

If you have problems using or questions about the web interface to the helpdesk system, please email [cxchelp \[at\] head.cfa.harvard.edu](mailto:cxchelp@head.cfa.harvard.edu).

In most cases you will receive an initial response to your ticket within two working hours of the time of submission.

NOTE: As of 24 May 2016 we have switched the CXC HelpDesk to a new platform. You will need to create a new account this system. If you are interested in accessing any of your old tickets, please send email to [cxchelp \[at\] cfa.harvard.edu](mailto:cxchelp@cfa.harvard.edu)

Before You Submit a Ticket

Doing some background work before submitting a HelpDesk Ticket will help us answer your question efficiently.

You can begin by **searching our online documentation**, particularly in the pages linked below. We have a search box (above) that is also available to help you find relevant information about your question.

- [CIAO pages](#)
 - [Data Analysis Guides](#)
 - [Data Analysis Threads](#)
 - [Check the CIAO FAQs](#)
 - [Known CIAO bugs](#)
- [Sherpa pages](#)
- [ChaRT pages](#)
- [Iris How-to Guide](#)

If you are running into a **tool error** or have a **question about your analysis**, please try to send us the following information.

- a step-by-step account of your process up to the problem area
- parameter settings (i.e. a copy of your parameter files)
- what CIAO (Sherpa, ChaRT etc.) version you are running
- what platform(s) you are using
- any web pages/threads you have been referring to

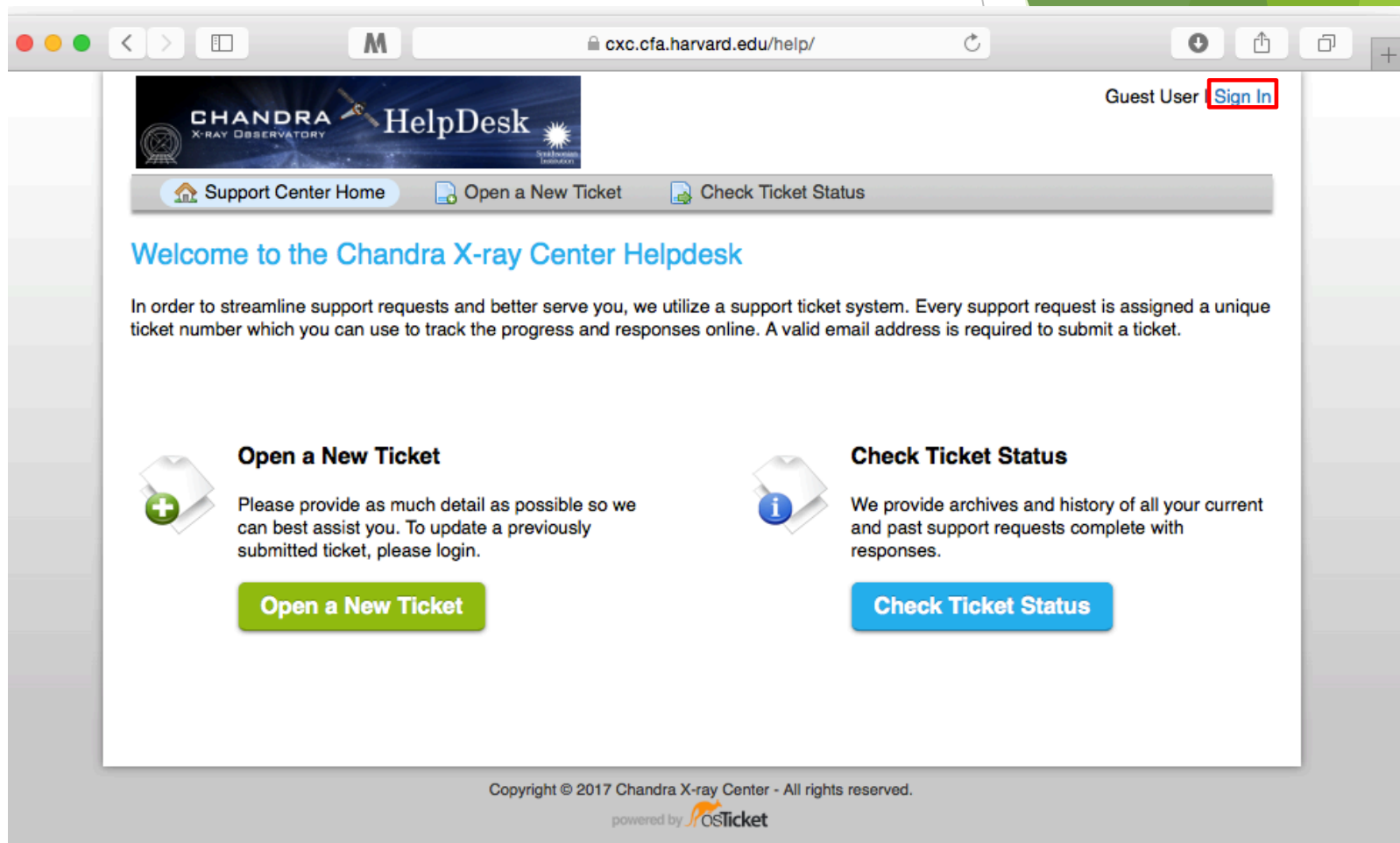
Sometimes it helps for us to have access to your data files. If we need them, we will ask you to provide them either by putting them somewhere we can access, or by ftp-ing them to our anonymous site. You also have the option to attach files to your ticket. Please make it clear what the axes are of any plots you send, and tell us how you created them.

[FTP instructions](#)

If you have **multiple related questions**, your problems may be more efficiently dealt with in a single ticket. Please think about consolidating questions whenever possible. However, if you have several **unrelated** questions, each should be the subject of a separate ticket.

Helpdesk “Log-in” Page

- ▶ guest user page
 - ▶ open ticket and check ticket responses
- ▶ users are not required to create an account to submit a ticket
- ▶ upon ticket submission, a ticket reference number is emailed to check on ticket status




CHANDRA X-RAY OBSERVATORY HelpDesk

Guest User [Sign In](#)

[Support Center Home](#) [Open a New Ticket](#) [Check Ticket Status](#)


Welcome to the Chandra X-ray Center Helpdesk

In order to streamline support requests and better serve you, we utilize a support ticket system. Every support request is assigned a unique ticket number which you can use to track the progress and responses online. A valid email address is required to submit a ticket.

 **Open a New Ticket**


Please provide as much detail as possible so we can best assist you. To update a previously submitted ticket, please login.

[Open a New Ticket](#)

 **Check Ticket Status**

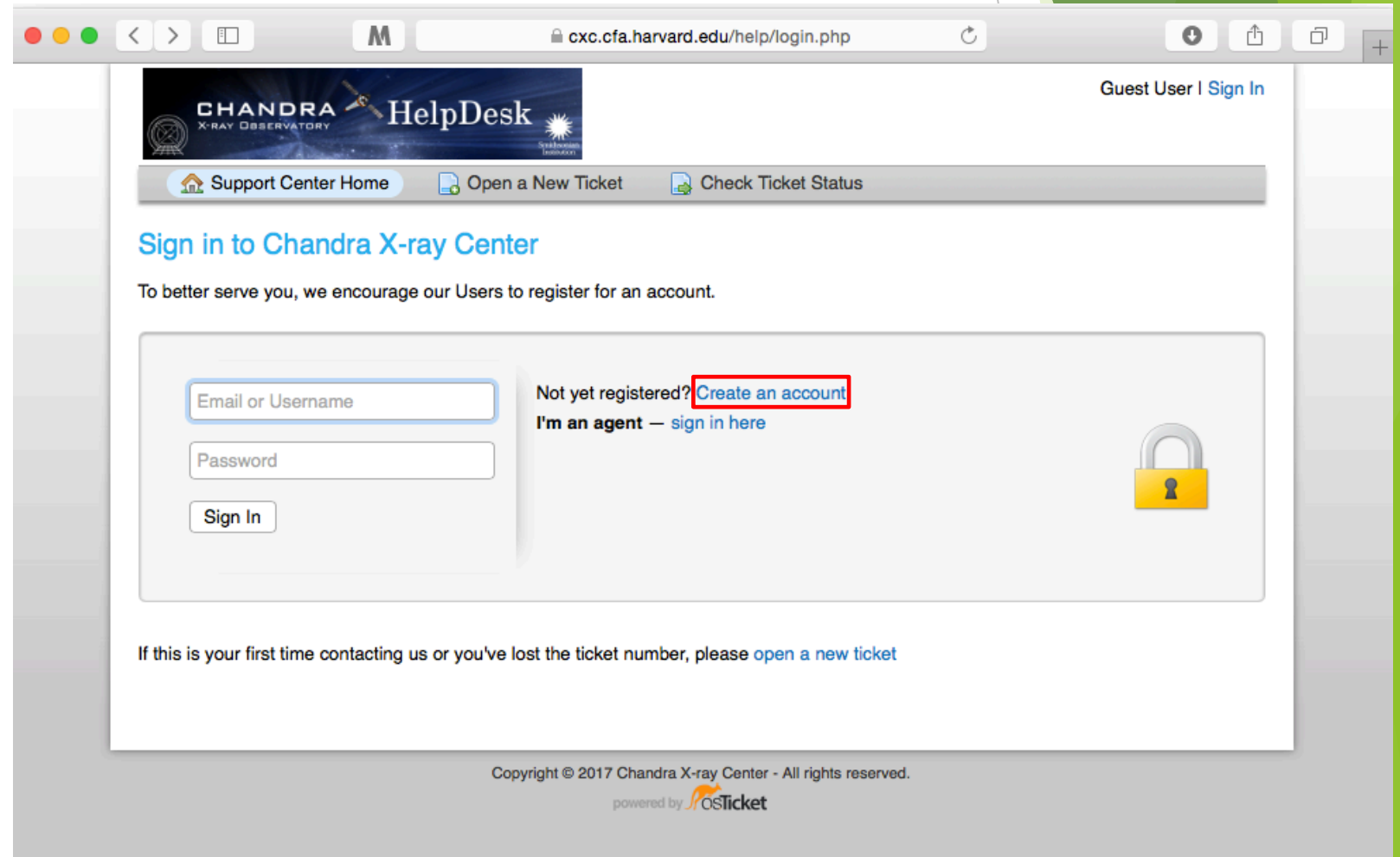
We provide archives and history of all your current and past support requests complete with responses.

[Check Ticket Status](#)

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Registered Users' Log-in Page

- ▶ registered users can look at ticket submission history and see all past tickets.
- ▶ account creation requires an email address, name, and password.



CHANDRA X-RAY OBSERVATORY HelpDesk

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Sign in to Chandra X-ray Center


To better serve you, we encourage our Users to register for an account.

Not yet registered? [Create an account](#)
I'm an agent — [sign in here](#)

If this is your first time contacting us or you've lost the ticket number, please [open a new ticket](#)

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Opening a New Ticket



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Open a New Ticket

Please fill in the form below to open a new ticket.

Help Topic:

Contact Information

Email Address:

Full Name:

Phone Number: Ext:

Ticket Details

Please Describe Your Issue

Issue Summary:

Issue Details:

Drop files here or choose them



Opening a New Ticket



guest user provides contact information to get notification of ticket updates

summary of issue; the subject header

- Select a Help Topic —
- IRIS ticket
- Chandra Source Catalog
- ✓ General Inquiry
- CIAO Installation
- CIAO Analysis
- ds9 question
- Archive
- Science Proposal
- Cost Proposal
- Address Change
- Changing Observation Parameters
- Observation Scheduling
- Einstein Fellowship
- Science Workshops

[Support Center Home](#) | [Open a New Ticket](#) | [Check Ticket Status](#)

Open a New Ticket

Please fill in the form below to open a new ticket.

Help Topic: General Inquiry

Contact Information

Email Address:

Full Name:

Phone Number: Ext:

Ticket Details

Please Describe Your Issue

Issue Summary:

Issue Details:

Details on the reason(s) for opening the ticket.

Drop files here or choose them

your question

Contents of a Ticket

- ▶ software information
 - ▶ CIAO version
 - ▶ CalDB version
 - ▶ Sherpa—stand alone or CIAO distribution
- ▶ platform and operating system
- ▶ question
 - ▶ what is the problem or concern encountered?
 - ▶ contextualize the question: what are you trying to do, what is your goal?
 - ▶ if referencing a document, include citation beyond just the authors (journal, volume, page)
- ▶ what did you do?
 - ▶ describe what you've done and the steps taken
 - ▶ provide commands used
 - ▶ copy-and-paste text or provide a log file; no screenshots please
 - ▶ include any messages returned by tool, including warning and error messages
 - ▶ provide supporting data files





Typical Helpdesk Ticket Questions

- ▶ I'm following this thread, but get an error message when running `acis_process_events` on an ACIS-S/HETG observation in CC-mode:
`# acis_process_events (CIAO 4.9): ERROR: CHIPY value < 1 or > 512.`
- ▶ I am trying to extract a spectrum for an ACIS observation and get zero exposure in the source region, help!
- ▶ I'm trying to figure out the pixel area of an image after removing a large number of regions (e.g. after removing some point sources). Can I do this with the **dmstat** tool? I'd like to compare the result with what I'm getting out of DS9/dax.
- ▶ There is a typo in the extracting spectra from point-like sources thread: a parameter name is misspelled in the example.
- ▶ I have a good idea, can this functionality be added into Sherpa?



“Borderline” Questions

- ▶ I noticed that most of the counts in my region are at very soft energies and is also evident in the spectrum of this region. Deciding whether or not to include photons below 0.3 keV in the imaging/spectral analysis is critical for my case, so to what extent can the counts at very soft energies be trusted, given the known instrumental effects in that energy range?
- ▶ I have been searching for long-term periodic variation (5d-3yr) in eight components of M87. Six components display no significant variation. The remaining two each have identical periodicities corresponding to 182.7 days (almost exactly half a year). The sources are not in close proximity to one another. Is there a known characteristic/aberration exhibited by *Chandra* that would account for this finding? All data used was recorded on ACIS-S3/ACIS-I3. My search of the CIAO threads and other forums does not seem to offer any information on the matter.
- ▶ unsupported platforms
 - ▶ I want to install on an old OS: Slackware/CentOS 5/Red Hat 5/Ubuntu 12/Play Station 3/etc... (missing libraries or operating system is too old that the latest available libraries are incompatible with the libraries used to build the binary)
 - ▶ I'm installing on Fedora 26/Ubuntu 17 and encountering problems (too new, libraries clash with binary CIAO built with older libraries)

Questions that are too General...

- ▶ I am doing analysis by counting counts to obtain the density of the circumstellar mass by obtaining luminosity and then flux. I am already familiar with doing this with *Swift*, but I am now having trouble with *Chandra*. I was wondering if based on my needs could you instruct me on how to use CIAO for my purpose?
- ▶ How do you remove a double source if it's contaminating the flux from the target source?

... or Beyond the Scope of the Helpdesk

- ▶ I can only see the abstracts of accepted proposals, can the entire proposal be made public?
- ▶ I am currently studying supernovae listed on the ChaSeR catalog and I need information to evaluate them. I was wondering if there would be a list of all these supernovae where more information (like the redshift or the explosion time) about these objects would be listed.
- ▶ I am fitting a spectrum but the nature of the source is unknown. I have tried many common models but the result is not good enough. The aim is to get a good fit to constrain the nature of the source, is there any way to tell which is the best model?
- ▶ How do I use HEASoft/FTools, XSpec, SAS, or ACIS Extract.



Resolving a Ticket

- ▶ with information and data in hand...
 - ▶ confirm issue by reproducing problem
 - ▶ test in another version of the software and operating system
 - ▶ check bugs page (cxc.harvard.edu/ciao/bugs) and list of known issues
- ▶ if necessary, consult:
 - ▶ a Scientist or Developer
 - ▶ software: CXC Data Systems group
 - ▶ science: CXC Science Data Systems and Calibration groups
 - ▶ instrument team (ACIS/HRC/Gratings)
 - ▶ subject-matter expert
- ▶ closing the ticket
 - ▶ get you an answer
 - ▶ improve the documentation: bug list update; add threads caveats; new idea for thread or why page
 - ▶ improve the software: bug report, software enhancement request, new tool specification



Helpdesk Metrics

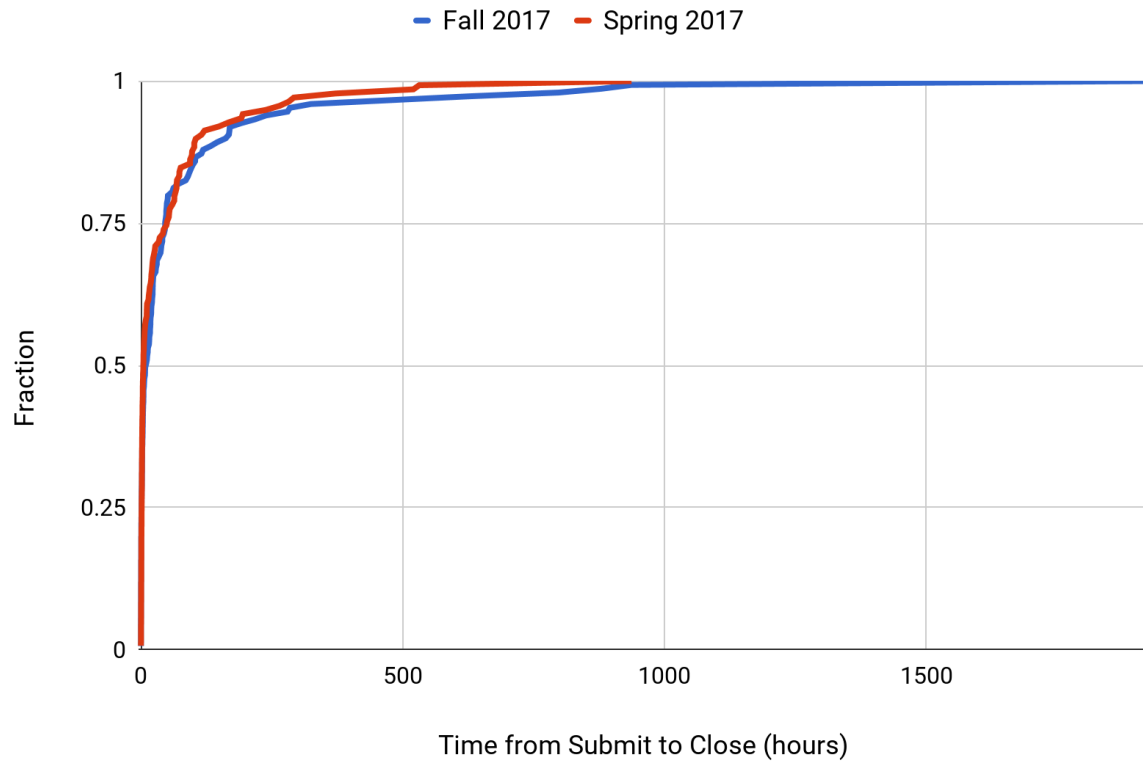
	2017	2016
Number of Tickets	285	307
Median time 1st contact [hrs]	1.28	3.48
Median time close [hrs]	6.08	17.32
Maximum time to close [hrs]	1918 ChaRT/MARX/PSF reopen	1470
% requiring consultation	12%	13%



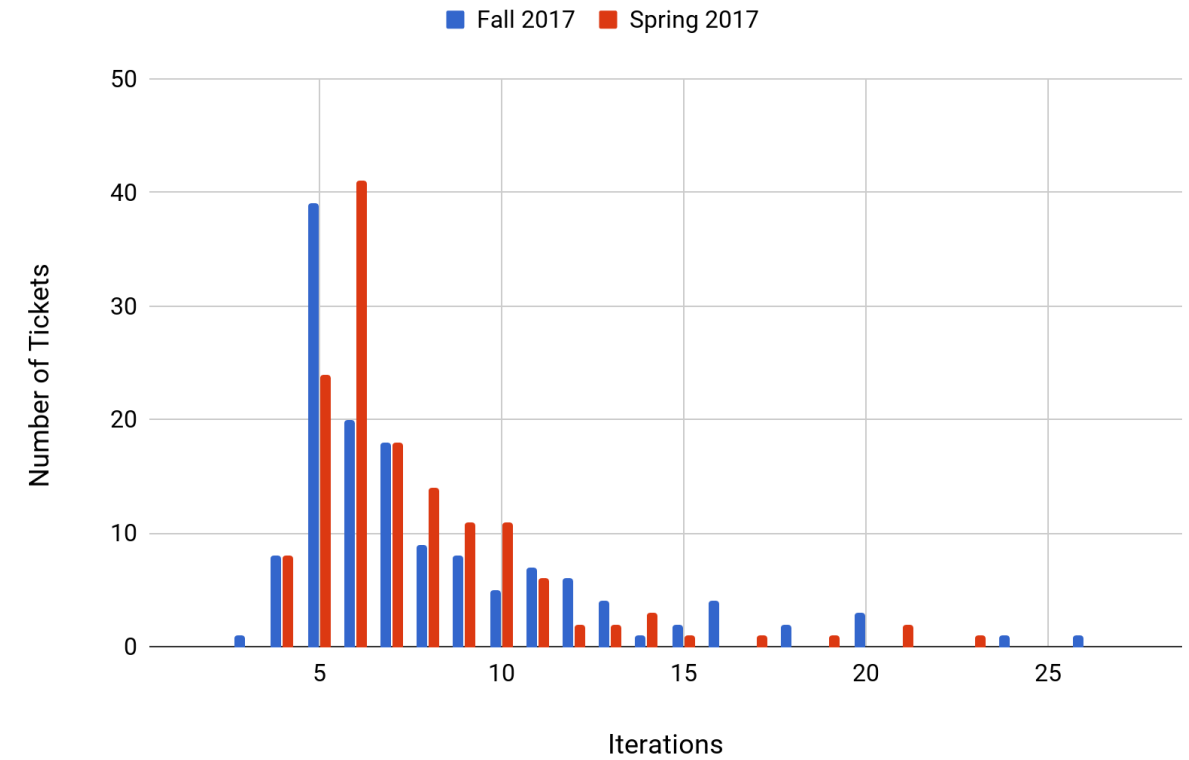
Helpdesk Metrics [continued]



Ticket Aging



Iterations per Ticket





Real Life Example (good) — I

April 7, 2016 10:39

I was wondering whether there are any tools etc for dealing with correcting an off-axis point source for pileup.

I have been following the pileup guide on the CIAO and Sherpa pages using the jdpileup model, but this seems to be based around an on-axis point source, where all the photons are spread over relatively few pixels. Is there any analogue or guidance for the case where the point source is off-axis, and photons are spread over many pixels (but still with significant pileup)?

A related, probably dumb question (but I am coming to this from particle physics so I am not an expert):

If I reduce the pileup fraction for a source by choosing a region with a central area of high pile-up excluded, (i.e. to extract from the wings of the point spread function), does specextract know about how the point spread function behaves well off-axis, and the way the higher energy photons are spread out than the lower energy ones? I presume the answer is yes, but like I said this is a new subject for me :)



Real Life Example (good) — I — comments

- ▶ I was wondering whether there are any tools etc for dealing with correcting an off-axis point source for pileup.

Clear question that's to the point.

- ▶ I have been following the pileup guide on the CIAO and Sherpa pages using the jdpileup model, but this seems to be based around an on-axis point source, where all the photons are spread over relatively few pixels. Is there any analogue or guidance for the case where the point source is off-axis, and photons are spread over many pixels (but still with significant pileup)?

Puts question into context, and for the case that he's interested in.

- ▶ If I reduce the pileup fraction for a source by choosing a region with a central area of high pile-up excluded, (i.e. to extract from the wings of the point spread function), does specextract know about how the point spread function behaves well off-axis, and the way the higher energy photons are spread out than the lower energy ones?

Puts forward an analysis idea in clear terms and asks for verification that a script can account for this case.



Real Life Examples (bad) — I

► August 15, 2016 13:42

Good morning I am new to CIAO, and when loading the file of SN2015G just as shown in the introduction of ciao I get an error message saying it was unable to download the fits. Do you know why this could happen?

► October 30, 2015 14:11

Hi, I am trying to make a nicer image for publication using the following thread. (http://asc.harvard.edu/ciao/threads/diffuse_emission/). I made a merged image by combining 3 ObsIDs using merge_obs tool. I then used exposure corrected image and followed above thread. It either gives "# dmfilth (CIAO 4.7): WARNING: Skipping bkg region #51 - no data (region outside image boundary?)." error or the output image (diffuse.img) is not fill the point sources.



Real Life Examples (bad) — I — comments

- ▶ Good morning I am new to CIAO, and when loading the file of SN2015G just as shown in the introduction of ciao I get an error message saying it was unable to download the fits. Do you know why this could happen?

No, more information is needed. What ObsID is the user looking at? What file is he using? Which introductory page is he referring to and what tools and commands are being used? What is the actual error message that's seen?

- ▶ I made a merged image by combining 3 ObsIDs using merge_obs tool. I then used exposure corrected image and followed above thread. It either gives "# dmfilth (CIAO 4.7): WARNING: Skipping bkg region #51 - no data (region outside image boundary?)." error or the output image (diffuse.img) is not fill the point sources.

While a description of steps are provided, what were the actual commands used? No files provided to test on to see the problem the user's concerned about.

Real Life Examples (good) — II

January 27, 2015 18:29

Hello, I am following the HETGS grating spectra thread
(http://cxc.harvard.edu/ciao/threads/spectra_hetgacis/index.html)

I am encountering a SIGSEGV error

===

```
-bash-4.1$ ciao
ERROR: The current environment is configured for:
CIAO 4.6 Monday, December 2, 2013
bindir : /nfs/cxc/a1/linux-x86_64/opt/packages/ciao-4.6/bin
CALDB : 4.5.9
```

Variables used:

```
i=13850
SPECOUT=hetgs_spectra
flt=13850/secondary/acisf13850_000N001_flt1.fits.gz
```

```
-bash-4.1$ dmcoppy "$SPECOUT/$i\_evt1a_flt.fits[EVENTS][@$flt][cols -phas]"
$SPECOUT/$i\_evt2.fits
# 5961: Received error signal SIGSEGV-segmentation violation.
# 5961: An invalid memory reference was made.
# 5961: segmentation fault: DMCOPY (1) is: exit_upon_error->NULL
===
```

I am attaching the evt1a and the flt file.

Chandra in Pune, October 23-27, 2017





Real Life Examples (good) — II — comments

- ▶ I am encountering a SIGSEGV error

The user describes the problem encountered.

- ▶ CIAO 4.6 Monday, December 2, 2013

```
bindir : /nfs/cxc/a1/linux-x86_64/opt/packages/ciao-4.6/bin
CALDB : 4.5.9
```

Provides the software and CalDB version used.

- ▶ -bash-4.1\$ dmcopy

```
"$SPECOUT/$i\_evt1a\_flt.fits[EVENTS][@$flt][cols -phas]"
$SPECOUT/$i\_evt2.fits
# 5961: Received error signal SIGSEGV-segmentation violation.
# 5961: An invalid memory reference was made.
# 5961: segmentation fault: DMCOPY (1) is: exit_upon_error-
>NULL
```

She defines the files and variables used; the command executed; and the entire error message returned by the tool.

- ▶ I am attaching the evt1a and the flt file.

Includes all the files used leading to the problem.

Real Life Examples (bad) — II

► December 1, 2014 14:58

I saw a chandra specialist did wavdetect in an unique way. He used dmcoppy to make fits file for every single CCD, then he ran wavdetect for every fits file. Do you know that is for what? Is it better to run wavdetect on a single ccd?

► July 6, 2010 14:51

Hi,
I've attached a script for you, i need help with the sherpa script...
thank you





Real Life Examples (bad) — II — comments

- ▶ I saw someone use `wavdetect` in an unique way. He used `dmcopy` to make FITS files for each CCD, then he ran `wavdetect` for each file. Do you know why he did this?

Without context and seeing exactly how he filtered the data, it's impossible to say why he did what he did. The user is better off asking the person directly. Be explicit!

Is it better to run `wavdetect` on a single CCD?

Too general of a question that's a judgement call which only the user can answer. "Better" is relative, with the trade offs that come with any computational problem.

- ▶ I've attached a script for you, I need help with the Sherpa script...

What does the user think is wrong with the script? What result does it return that's wrong?



Real Life Examples (good) — III

June 5, 2013 13:06

CIAO version 4.5

CALDB version 4.5.5.1

Trying on both a Macbook Pro (OS 10.8.3) and Linux (Ubuntu 12)

=====

I am trying to take a general survey of quasars Chandra archive. I have been going through a list of obsids, but am finding some issues with determining which chip the target point source is on. I have noticed in the past that the CCD_ID listed in the evt2 file fits header does not always agree with the actual chip id that the target is on.

For example, with ObsID 3472 (and HETGS observation):

```
>> evt2=`ls primary/*evt2*`  
>> dmkeypar $evt2 CCD_ID echo+  
4
```

But I know the zeroth order of the source is centered on chip 7.

If I open the evt2 file in ds9, I can overlay a region centered on the point source. When I then use the Analysis -- CIAO -- Coords -- Chip tool, it returns chip 7.

However, if I move the region to a different part of the image that is clearly a different chip, the Coords--Chip tool still returns 7. This makes it very difficult to check what is printed as CCD_ID in the header, making it very difficult to automate the process. Please help!



Real Life Examples (good) — III — comments

- ▶ CIAO version 4.5
CALDB version 4.5.5.1

Trying on both a Macbook Pro (OS 10.8.3) and Linux (Ubuntu 12)

The user provides software information and shows which platforms she's encountered the issues on.

- ▶ I have noticed in the past that the CCD_ID listed in the evt2 file fits header does not always agree with the actual chip id that the target is on.

Primary concern concisely stated.

- ▶

```
>> evt2=`ls primary/*evt2*`  
>> dmkeypar $evt2 CCD_ID echo+  
4
```

But I know the zeroth order of the source is centered on chip 7.

Shows what she did, given a specific ObsID, and what is returned by the tool, which contradicts what she knows about the observation.

- ▶ If I open the evt2 file in ds9, I can overlay a region centered on the point source. When I then use the Analysis -- CIAO -- Coords -- Chip tool, it returns chip 7. However, if I move the region to a different part of the image that is clearly a different chip, the Coords--Chip tool still returns 7.

The user also describes another problem she sees in DS9: what was done, what was returned, and what she finds confusing.



Real Life Examples (bad) — III

► November 26, 2009 10:47

Hello

I use dmextract to get the light curve for a point source in ACIS data, and I have been received these warnings:

```
# dmextract (CIAO 4.1): WARNING: Input file,  
"acis_dstrk_evt2.fits[ccd_id=2,sky=region(source.reg)]", has no rows in it.
```

```
# dmextract (CIAO 4.1): WARNING: Input file,  
"acis_dstrk_evt2.fits[ccd_id=2,sky=region(back.reg)]", has no rows in it.
```

I am sure about the ccd id and source.reg, back.reg. I don't know what my mistake is .

► July 8, 2010 15:43

You know what I'm doing, it's Cassiopeia A, all I need is to get the energy spectrum... The way u said worked... I used specextract and got the files i needed... but then something seems to be not right with sherpa script. I thought i was supposed to get a clear one like the ones from Mrk 421, but I don't understand it...



Real Life Examples (bad) — III — comments

- ▶ "`acis_dstrk_evt2.fits[ccd_id=2,sky=region(back.reg)]`", has no rows in it. I am sure about the `ccd_id`, `source.reg`, and `back.reg`. I don't know what my mistake is.

The files named in the error/warning messages aren't provided. The problem is that with generic file names, an ObsID is needed to begin an investigation. This problem is compounded if generic region names are also used in the command-line syntax, in which case the contents of the region files need to be provided too.

- ▶ You know what I'm doing, it's Cassiopeia A. All I need is the energy spectrum... the way you said worked... I used `specextract` and got the files I need...

The user assumes the ticket will be assigned to the same support staff member, so she doesn't provide any details for the question.

something seems not to be right with the Sherpa script. I thought I was supposed to get a clear one like the ones from Mrk 421, but I don't understand it...

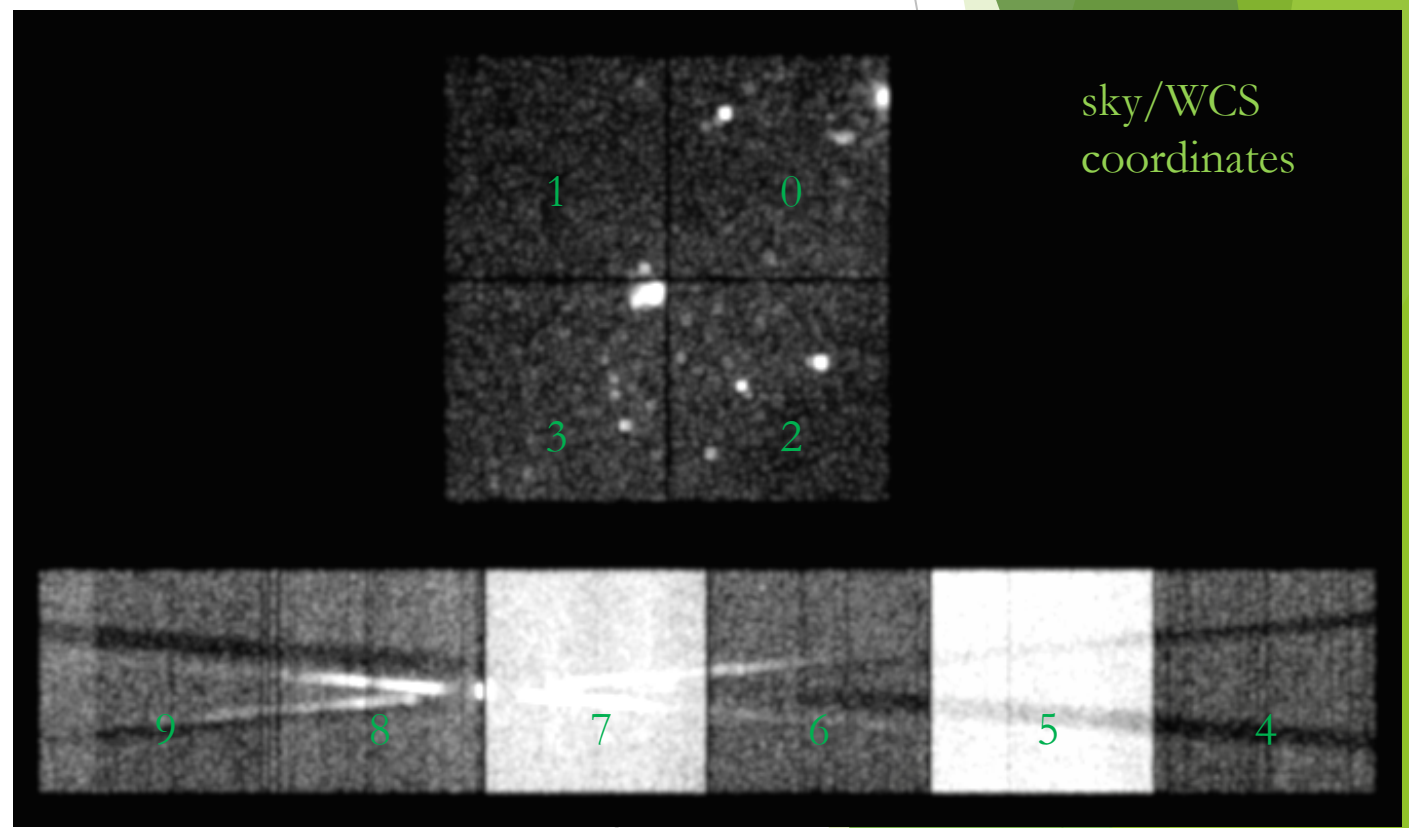
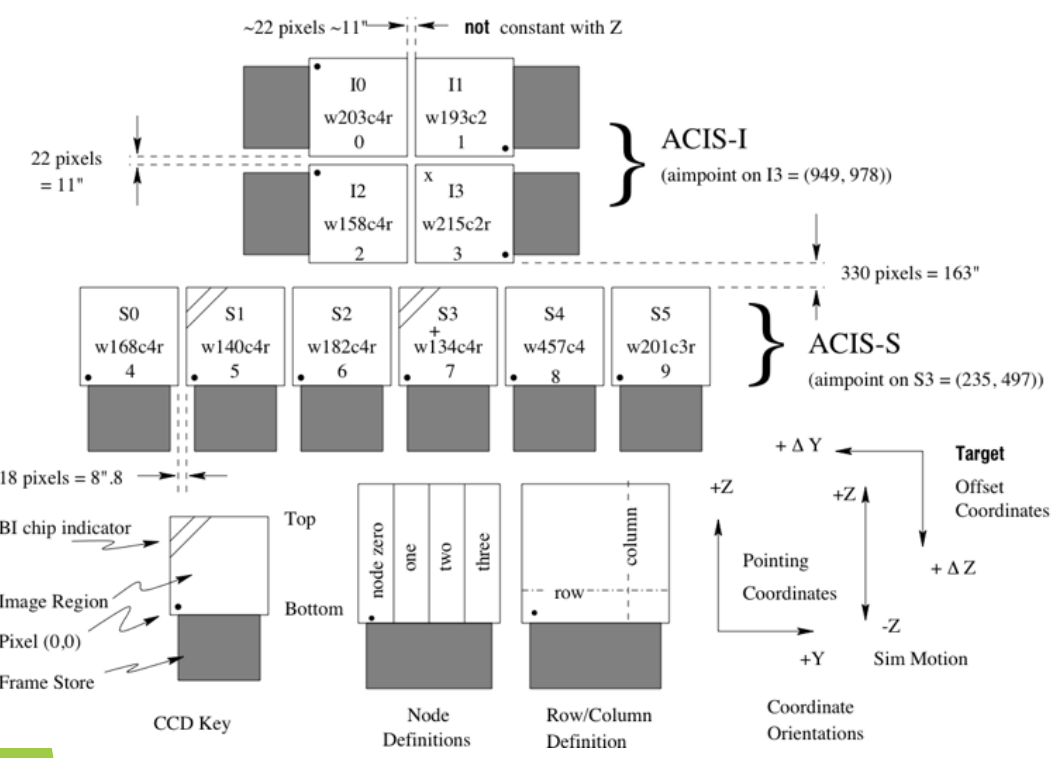
What seems wrong with the Sherpa results? What does "clear one" mean? What doesn't the user understand?



An aside on the Previous dmextract Ticket

How can the CCD_ID be mistaken in an observation?
It's really easy to, especially if only the ACIS-I array is used...

ACIS FLIGHT FOCAL PLANE





Collated Real Life Example

July 2016

I am currently reading the paper “X-ray Study of Sources in Incognito with *Chandra*” by Zaphod, et al 2008 (MNRAS) and I am trying to generate the lightcurve for Incognito data. In the paper they have identified N different sources within the galaxy and plotted the lightcurves for source x and source y .

I did everything and got the result. I downloaded the data and plotted the light curve for the single evt2 file available for HRC-I. The two plots do not match. Is my method correct?

How do I find out about the energy range the source is emitting? Is there any command or something to specify the energy range or know the energy range of the source? I also searched the analysis guides on the website and found the command under the topic energy filter, [`energy=2000:3000`], and when I used it, I got an error saying: “**IOError: Error: Could not find identifier energy.**” In the paper, why do they filter the energy value? Can I use the other observation, which uses ACIS-S data, to generate a lightcurve?



Real Life Example — comments

- ▶ I am currently reading the paper “X-ray Study of Sources in Incognito with *Chandra*” by Zaphod, et al 2008 (MNRAS) and I am trying to generate the lightcurve for Incognito data.

The user is clear about wanting to create lightcurves, but what is the full journal reference to the article? It's probable the reference will be found after querying ADS, but occasionally the title provided is the pre-print title found in “astro-ph” that differs from the published version, making the search tougher.

- ▶ I did everything and got the result. I downloaded the data and plotted the light curve for the single evt2 file available for HRC-I.

What does “I did everything” mean? Need more information about what's actually done before being able to move forward.

- ▶ The two plots do not match.

What plots? Is it that the lightcurves extracted don't match each other, or do the extracted lightcurves not match the lightcurves in a figure in the paper? If the latter, what are the figure numbers?



Real Life Example — comments [cont.]

- ▶ Is my method correct?

Did some of the text get lost? Some information and context is missing about the "method" used. That is, between downloading the data and plotting the light curve, what data processing was done? What commands were used to extract the lightcurve? What are the defined regions? Which ObsIDs are used?

- ▶ How do I find out about the energy range the source is emitting? Is there any command or something to specify the energy range or know the energy range of the source?

Knowing the basic characteristics of the instrument used for an observation is important.

- ▶ In the paper, why do they filter the energy value?

Is it explained somewhere in the paper? At the very least, provide the information about the range the authors filtered on, so an educated guess can be made.

- ▶ Can I use the other observation, which uses ACIS-S data, to generate a lightcurve?

Understanding the capabilities of the instrument of interest is useful. Looking at the paper's text and figures referenced in the ticket, the authors used ACIS data to generate the lightcurves.

Finally...

- ▶ Please reply back if you're satisfied with the answer/solution so we can go ahead and close the ticket.
- ▶ If you have a completely unrelated question, instead of adding to an existing ticket, just open a new ticket.
- ▶ Help us help you!
 - ▶ the more information you're able to provide up front means a quicker resolution to the concern
- ▶ Ultimately, the documentation, software, and helpdesk are meant to help you get to a specific data product.
 - ▶ what you do with the data product will be determined by your science goals and judgement
 - ▶ doing science is outside the scope of what helpdesk can support






The *Chandra* Data Archive

cxc.harvard.edu/cda

ChaSeR: *Chandra* Search and Retrieval System

cda.harvard.edu/chaser/



Chandra X-ray Center [New Search](#) [Retrieval List](#) [Help](#) 

Observation Search

Search Reset

[File Upload](#) no file selected

[Cone Search](#)

[Target Name](#) [RA/Long/l](#) [Dec/Lat/b](#)

[Name Resolver](#) [Coord System](#) [Equinox](#) [Radius](#) arcmin

[Observation ID](#) [Sequence Number](#) [Proposal Number](#)

[Proposal Title](#) [PI Name](#) [Observer Name](#)

[Start Date](#) [Public Release Date](#)

[Exposure Time \(ks\)](#) [Approved Time \(ks\)](#) [Avg. Count Rate \(hz\)](#)

[Status](#)

[Science Category](#)

[Type](#)

[Instrument](#)

[Grating](#)

[Exposure Mode](#)

[Joint Observatories](#)

Customize Output:

[Sort Order](#) ascending descending

[Row Limit](#)

[Coord System](#) [Equinox](#) [Format](#)

[Save As](#)

For online support please contact the [CXC Helpdesk](#).



ChaSeR: *Chandra* Search and Retrieval System

cda.harvard.edu/chaser

- ▶ browse the observation catalog with a variety of search criteria
- ▶ search fields are self-explanatory, links lead to description of usage and input format
- ▶ cone search or range of coordinates around a celestial position or target name
 - ▶ target name can be resolved to a position with SIMBAD and NED
 - ▶ a list of up to 5000 positions can also be supplied to query the catalog
- ▶ syntax for a range of dates: T_1/T_2 , $T_1/$, $/T_2$
 - ▶ T_n format: YYYY-MM-DD
 - ▶ between T_1 and T_2 , after T_1 , before T_2



ChaSeR (continued)

source name and name resolver

data public release date

observation start date

maximum number of rows returned

The screenshot shows the Chandra X-ray Center Observation Search web interface. The browser address bar shows `cda.harvard.edu/chaser/`. The page title is "Chandra X-ray Center Observation Search".


Key features and annotations:

- Search Filters:**
 - File Upload:** Coordinates dropdown, Choose File button, no file selected.
 - Target Name:** Input field with a red box around it.
 - Name Resolver:** SIMBAD/NED dropdown.
 - Start Date:** Input field with a red box around it.
 - Public Release Date:** Input field with a red box around it.
 - Row Limit:** Dropdown menu set to 50, with a red box around it.
- Other Fields:**
 - RA/Long/l, Dec/Lat/b, Coord System (Equatorial J2000), Equinox (2000), Radius (10 arcmin).
 - Sequence Number, Proposal Number, PI Name, Observer Name.
 - Exposure Time (ks), Approved Time (ks), Avg. Count Rate (hz).
 - Status (Archived, Observed, Scheduled, Unobserved, Untriggered).
 - Science Category (Solar System, Stars and WD, WD Binaries and CV, BH and NS Binaries, SN, SNR and Isolated NS).
 - Type (ER, GO, GTO, TOO, DDT, CAL).
 - Instrument (ACIS, ACIS-I, ACIS-S, HRC).
 - Grating (None, LETG, HETG).
 - Exposure Mode (ACIS TE, ACIS CC, HRC Timing).
 - Joint Observatories (None, HST, NOAO, NRAO, NuSTAR).
 - Observing Cycle (00-04), Proposal Cycle (00-04).
- Customize Output:**
 - Sort Order: Status dropdown, ascending/descending radio buttons.
 - Coord System: Equatorial J2000 dropdown, Equinox: 2000, Format: Sexagesimal (hh/dd mm ss.ss) dropdown.
 - Save As: Input field.

ChaSeR (continued)



M87

Chandra X-ray Center **Observation Search** [New Search](#) [Search Results](#) [Retrieval List](#) [Help](#) 

Search Reset

File Upload no file selected

Target Name **RA/Long/l** 12 30 49.42 **Dec/Lat/b** +12 23 28.04

Name Resolver (SIMBAD/NED) **Coord System** Equatorial J2000 **Equinox** 2000 **Radius** 10 arcmin

Observation ID **Sequence Number** **Proposal Number**

Proposal Title **PI Name** **Observer Name**

Start Date 2003-01-01/2017-10-01 **Public Release Date** /2017-10-23

Exposure Time (ks) **Approved Time (ks)** **Avg. Count Rate (hz)**

Status	<input type="checkbox"/> Archived <input type="checkbox"/> Observed <input type="checkbox"/> Scheduled <input type="checkbox"/> Unobserved <input type="checkbox"/> Untriggered	Science Category	<input type="checkbox"/> Solar System <input type="checkbox"/> Stars and WD <input type="checkbox"/> WD Binaries and CV <input type="checkbox"/> BH and NS Binaries <input type="checkbox"/> SN, SNR and Isolated NS	Type	<input type="checkbox"/> ER <input type="checkbox"/> GO <input type="checkbox"/> GTO <input type="checkbox"/> TOO <input type="checkbox"/> DDT <input type="checkbox"/> CAL	Observing Cycle	<input type="checkbox"/> 00 <input type="checkbox"/> 01 <input type="checkbox"/> 02 <input type="checkbox"/> 03 <input type="checkbox"/> 04			
Instrument	<input type="checkbox"/> ACIS <input type="checkbox"/> ACIS-I <input type="checkbox"/> ACIS-S <input type="checkbox"/> HRC	Grating	<input type="checkbox"/> None <input type="checkbox"/> LETG <input type="checkbox"/> HETG	Exposure Mode	<input type="checkbox"/> ACIS TE <input type="checkbox"/> ACIS CC <input type="checkbox"/> HRC Timing	Joint Observatories	<input type="checkbox"/> None <input type="checkbox"/> HST <input type="checkbox"/> NOAO <input type="checkbox"/> NRAO <input type="checkbox"/> NuSTAR	Proposal Cycle	<input type="checkbox"/> 00 <input type="checkbox"/> 01 <input type="checkbox"/> 02 <input type="checkbox"/> 03 <input type="checkbox"/> 04	Grid <input type="button" value=""/>

Customize Output:

Sort Order ascending descending


Row Limit

Coord System Equatorial J2000 **Equinox** 2000 **Format** Sexagesimal (hh/dd mm ss.ss)


Save As

For online support please contact the [CXC Helpdesk](#).

ChaSeR Query Results



Chandra X-ray Center [New Search](#) [Search Results](#) [Retrieval List](#) [Help](#)

Search Results 

[Primary package](#)
 [Secondary package](#)
 [Custom selection](#)

[Select all](#) | [Unselect all](#)

Select	Row	Seq Num	Obs ID	Instrument	Grating	Appr Exp	Exposure	Target Name	PI Name	RA	Dec	Status	Data
<input type="checkbox"/>	1	700656	3977	ACIS-S	NONE	5.0	5.28	M87	Harris	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	2	700657	3978	ACIS-S	NONE	5.0	4.85	M87	Harris	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	3	700658	3979	ACIS-S	NONE	5.0	4.49	M87	Harris	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	4	700659	3980	ACIS-S	NONE	5.0	4.79	M87	Harris	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	5	700660	3981	ACIS-S	NONE	5.0	4.68	M87	Harris	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	6	700661	3982	ACIS-S	NONE	5.0	4.84	M87	Harris	12 30 49.00	+12 23 30.00	archived	F
<input checked="" type="checkbox"/>	7	700998	4917	ACIS-S	NONE	5.0	5.03	M87	Biretta	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	8	700686	4007	ACIS-S	NONE	40.0	36.18	NGC 4486B	Fabbiano	12 30 31.80	+12 29 26.00	archived	V
<input type="checkbox"/>	9	700999	4918	ACIS-S	NONE	5.0	4.68	M87	Biretta	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	10	701000	4919	ACIS-S	NONE	5.0	4.7	M87	Biretta	12 30 49.00	+12 23 30.00	archived	F
<input type="checkbox"/>	11	701002	4921	ACIS-S	NONE	5.0	5.25	M87	Biretta	12 30 49.00	+12 23 30.00	archived	F

104 observations found
 Position=cone of radius 10 arcmin around RA: 12 30 49.42, Dec: +12 23 28.04 (frame=j2000 equinox=2000)
 Start Date=2003-01-01/2017-10-01
 Public Release Date=/2017-10-23
 Status=archived; observed; scheduled; unobserved; untriggered
 Instrument=ACIS
 Grating=NONE
 Type=GO; GTO; TOO; DDT; CAL
 Exposure Mode=TE
 Sort Order=Start Date ascending

ChaSeR ObsID Entry



details of the instrument configuration for the observation

V&V—Verification and Validation—report includes a summary of any anomalies during the observation, usually noted in the Comments section

list of ADS links to publications that have made use of the observation data

The screenshot shows the Chandra X-ray Center Observation Viewer interface. The browser address bar displays `cda.harvard.edu/chaser/dispatchOcatResults.do`. The page title is "Observation Viewer". The Chandra X-ray Center logo is on the left, and navigation links for "New Search", "Search Results", "Retrieval List", and "Help" are on the right. A "Chandra Data Archive" logo is also present, along with a "Not logged in" status and a "Login" button.

The main content area displays the following information for Observation ID: 4917:

Observation ID: 4917	Sequence Number: 700998	Status: archived
<input type="button" value="Add to Retrieval List"/>	Observation ID: 4917	Proposal Number: 05701072
<input checked="" type="checkbox"/> Primary package	Type: GO	Proposal Cycle: 05
<input checked="" type="checkbox"/> Secondary package	PI Name: Biretta	Observer: Harris
<input type="checkbox"/> Custom selection	Science Category: ACTIVE GALAXIES AND QUASARS	Joint Observatories: CXO-HST
Summary	Target Name: M87	Grid Name:
Details	RA (J2000): 12 30 49.00	Data Mode: FAINT
V&V Report	Dec (J2000): +12 23 30.00	Observing Cycle: 05
Proposal Abstract	Instrument: ACIS-S	Public Release Date: 2004-11-14 16:28:26
Images	Grating: NONE	
Data packages	Start Date: 2003-11-11 19:45:02	
Primary	Approved Time: 5.00 ks	
Secondary	Exposure Time: 5.03 ks	
External links		
Publications		
Processing Status		
Sequence Summary		
Related Observations		
By Sequence		
By Proposal		
By Monitor/Followup		
By Group		
By Grid		

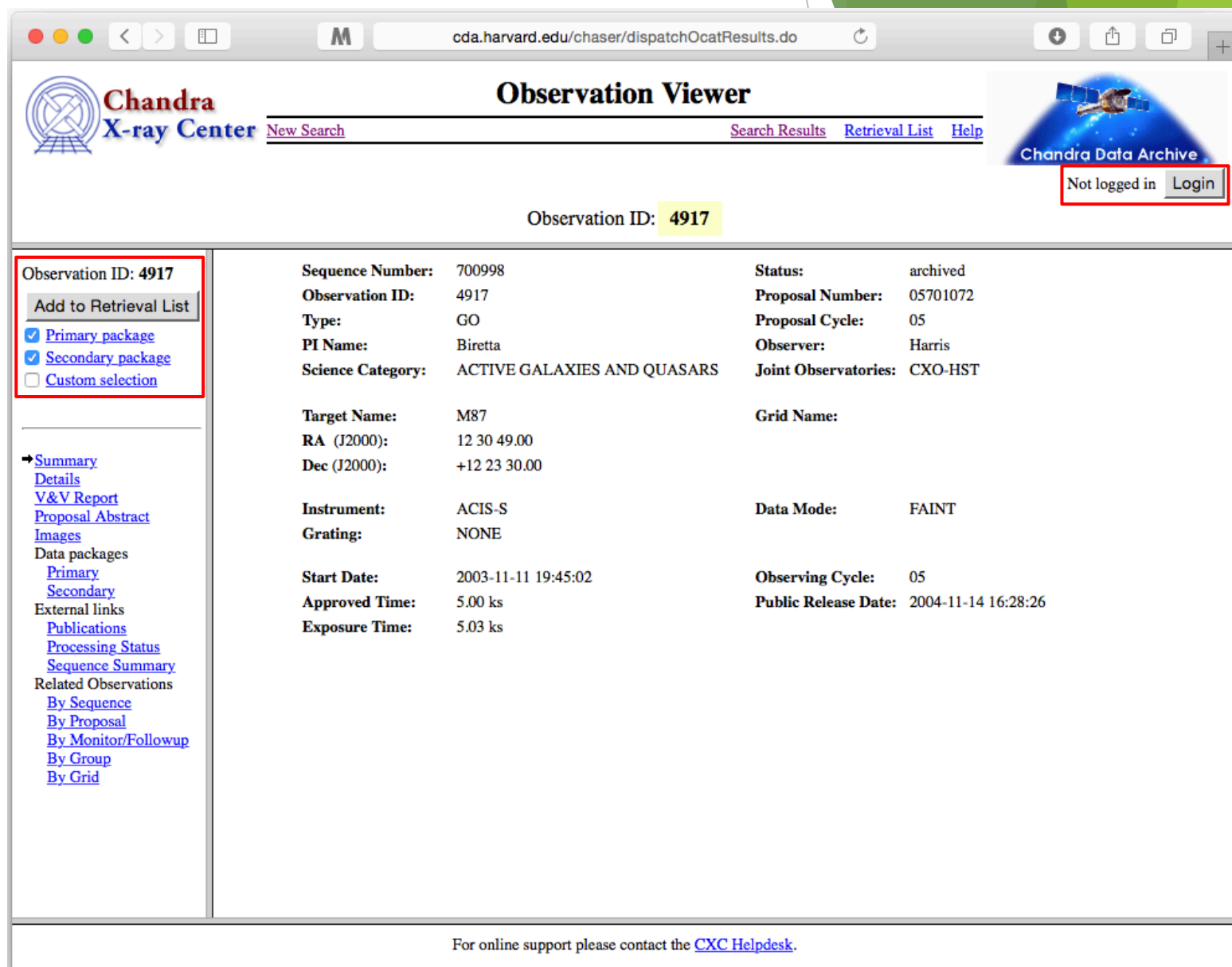
Annotations on the screenshot:

- A red arrow points from the text "details of the instrument configuration for the observation" to the "Primary package" and "Secondary package" checkboxes.
- A red arrow points from the text "V&V—Verification and Validation—report includes a summary of any anomalies during the observation, usually noted in the Comments section" to the "V&V Report" link.
- A red arrow points from the text "list of ADS links to publications that have made use of the observation data" to the "Publications" link.
- A red arrow points from the text "preview images" to the "Images" link.
- A red arrow points from the text "shows a table which indicates if any problems were identified in the observation during pipeline processing" to the "Processing Status" link.

At the bottom of the page, it says: "For online support please contact the [CXC Helpdesk](#)."

ChaSeR ObsID Entry

- ▶ for non-proprietary data:
 - ▶ option to stage primary, secondary, or customized set of data products for retrieval
 - ▶ for typical analysis, once you have the ObsID of interest, just use `download_chandra_obsid`
- ▶ ChaSeR is required to obtain proprietary data.
- ▶ If the existing archive interfaces do not meet your needs, the archive team may consider a special request: cxc.harvard.edu/cgi-gen/cda/specreq



Chandra X-ray Center [New Search](#) [Search Results](#) [Retrieval List](#) [Help](#)

Chandra Data Archive
Not logged in [Login](#)

Observation ID: **4917**

Observation ID: 4917

 Primary package
 Secondary package
 Custom selection

[Summary](#)
[Details](#)
[V&V Report](#)
[Proposal Abstract](#)
[Images](#)
 Data packages
[Primary](#)
[Secondary](#)
 External links
[Publications](#)
[Processing Status](#)
[Sequence Summary](#)
 Related Observations
[By Sequence](#)
[By Proposal](#)
[By Monitor/Followup](#)
[By Group](#)
[By Grid](#)

Sequence Number:	700998	Status:	archived
Observation ID:	4917	Proposal Number:	05701072
Type:	GO	Proposal Cycle:	05
PI Name:	Biretta	Observer:	Harris
Science Category:	ACTIVE GALAXIES AND QUASARS	Joint Observatories:	CXO-HST
Target Name:	M87	Grid Name:	
RA (J2000):	12 30 49.00	Data Mode:	FAINT
Dec (J2000):	+12 23 30.00	Observing Cycle:	05
Instrument:	ACIS-S	Public Release Date:	2004-11-14 16:28:26
Grating:	NONE		
Start Date:	2003-11-11 19:45:02		
Approved Time:	5.00 ks		
Exposure Time:	5.03 ks		

For online support please contact the [CXC Helpdesk](#).