



CIAO features that should be added or improved

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- 9 - more graphical interfaces to tools/plotting/imaging
- 12 - Ability to use S-lang on `_internal_ ChIPS/Sherpa` variables.
DM access via IDL.
DM to develop a pipe `<STDIN>/<STDOUT>` option.
- 13 - CIAO equivalents of XMM SAS commands "xmmselect" and "evigweight" would be **extremely** useful.
- 14 - lightcurve
- 15 - psextract. I would love to see psextract rewritten to assume less and to allow users greater range in what they may provide to it, for instance multiple forms of mkarf and mkrmf.
- 16 - Add scripting of ciao tools and better interface with other software, eg IDL. It seems rather difficult to call ciao process from IDL.
- 18 - Faster, more reliable, less bloat
- 19 - Sherpa speed could be greatly improved. I do all spectral fitting in xspec except where Sherpa is required, e.g. low-count spectra where Sherpa's expanded statistical methods are necessary.
- 21 - csmooth; examples in documentation; history recording in FITS headers; sherpa documentation & tutorials; simple smoothing tool (gaussian, tophat, etc.) similar to the ftool fgauss; cross-referencing between ahelp documents on the web.
- 24 - PSF photometry!
- 25 - 1) region syntax needs ability to specify unions, negations etc to build stock, reusable shapes (e.g. a bit like in povray) existing syntax has odd non-intuitive bits..., e.g.
+shapel
+shape2
-srcl
-src2
only removes srcl and src2 from the shape2, not from shapel

2) dmregrid needs to handle wcs info, rotations, rebinning robustly.
3) dmregrid needs to be able to rebin images to arbitrary pixels sizes based on wcs info, not just fixed integer rebinning factors.
- 27 - efficiency in handling large arrays.
- 28 - more stability in the parameters between releases to make scripting

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easier

29 - It's not so much CIAO but a better description of the data products would be helpful. The threads get the job done but they leave one wondering what's going on.

30 - better looking graphs via chips

31 - GUI to review and manage parameter files

Easy scripting

Less opaque customization (S-Lang is fairly obscure compared to IDL)

32 - More control over plot features in CHIPS (axis labels, linewidths, etc., for publication quality plots)

35 - XMM-Newton delivers response matrices appropriate to the given observation. That would be very nice.

Timing tools need to be improved.

LETG-ACIS response matrix generation fails often and inexplicably.

38 - spectral analysis tools

39 - Finding source position in zeroth order image for piled-up HETG observation. Handling CC mode data

40 - timing analysis and tools about HRC+LETG and maybe it can be more user friendly

43 - phased light curves

more slang modules for interactive, customizable analysis, such as region functions, math libraries.

filtering guides (e.g., for bright sources, can any standard filtering parameters be relaxed to get more exposure?)

47 - Scripting of spectral fitting could be improved although will be better with Slang. Fitting of confused sources could be documented/explained better. Deprojection of extended sources.

51 - the one thing I'd like to be able to do in sherpa is to read in data from an ascii data file and specify which lines of the data file I would like to read in. I know you can specify which columns of the data file to read in, but it would be nice to read in specific lines, rather than all the lines of the data file.

53 - error messages

56 - I would like to see csmooth worked on so that it is applicable to the exposure map in a sensible manner.

57 - Identifying discrete sources above an arbitrary sigma value

58 - I'd like a Darwin (OS X) port. I purchased a linux box specifically to perform Chandra analysis, though I already own and work on a dual processor G4.

59 - improved 1D plotting and contouring

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- 60 - Sometimes When I am analysing the data using CIAO, the tools in CIAO are just like black box, I do not know how the tools work.
- 62 - sherpa
- 63 - Right now, region handling is a little shaky. There are not enough examples on-line or in the help files which explain, for example, how to give CIAO regions in RA, Dec format (need a "d" at the end of the numbers!!)
- 64 - Would like more scripts and/or software support for large-scale projects that use large off-axis angles and very different observing environments, modes. That is, observations that are not single pointings of on-axis point sources.
- 80 - The ability to export plots to .jpg format
- 81 - fitting and modelling tools to support analysis of photoionized plasma
- 82 - S3 CTI correction
- More precise PSF library for mkpsf. I don't care how big it is (one could probably degrade the resolution by x2). CHART + MARX is too complicated and doesn't cut it for making PSFs for hundreds of sources.
- More up to date version of CSMOOTH (preferably one that more effectively incorporates exposure maps).
- 83 - it might be technical but I like how ftools can handle the gzipped data especially it can create a gzipped output file in the following manner
fselect input.fits.gz output.fits.gz "energy < 2000"
- inclusion of the subpixel_resolution software
- 84 - ease of installation
- 89 - vtpdetect
- 90 - It's not always clear which parameters (in, e.g., dmgroup) are actually being looked at when a task is run.
- Additional examples in some of the ahelp documentation would be useful for some of the more configurable tasks (e.g., dmgroup).
- 99 - ALL threads reviewed by a scientist to ensure that they are useable and accurate.
- 103 - make user (table) models in sherpa much easier to implement.
there should be a better image interface than ds9 with, e.g., RGB (three-channel) image display.
- 104 - Well, the help should be given at a level to be useful to first time users. I can't even convert the flux to a useful unit, as there is no help for such "trivial" concerns on the CIAO/chandra webpage.
- 105 - All aspects of data analysis that I need are sufficiently well supported and documented.
- 106 - I'd like to see monte-carlo goodness of fit estimates introduced into sherpa for Cash statistic. I'd also like better support for using a 1D psf as an instrument model when fitting a radial profile to extended emission. I'd also like to see a temperature profile model,

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that uses psf info and deprojection introduced.

Oh and it would be good to have a source detection method that worked in several energy bands, using the correct psf at each position and energy, and gave estimates of whether sources are extended

- 108 - sherpa - more flexibility
more scripts to do repetitive processing tasks
- 109 - csmooth: bugs need to be fixed, needs to properly smooth exposure and background to match data
- 118 - source spatial analysis
- 119 - The timing analysis section is poorly implemented. It would be useful to have more XRONOS-like tools.
- 121 - XSPEC
- 124 - Better access to internals.

Better documentation of interfaces. Can sherpa and ciao functionality be put into libraries with documented interfaces? I seldom use the slang capabilities because of the lack of documentation, particularly the relation between slang and the tools. The features look interesting, but I can't make much use of it until I know what the slang/ciao/sherpa interfaces actually are.

Better access to internal data. (I understand this improves a lot with ciao 3) I want to be able to grab the results of a projection and manipulate it outside sherpa. I want to be able to automate things, so I need to be able to extract much of the sherpa state (fit parameters, fit parameter errors, ...) easily. The MDL files are a start, but they only capture a small part of the state needed.

There seems to be virtually no support for mosaicing. I would like to be able to combine datasets for larger regions. The available tools basically allow reprojection to a given tangent plane, but that's about it.

I need a way of doing algebra on images. For example, I want to be able to construct an error image from a counts image. Where do I turn for a tool to take the square root of an image? (I'm going to have to roll my own.)

An instance where this is needed is to try out csmooth. I look at csmoothed images and at unsmoothed images, and I just don't believe csmooth. So far, I haven't been able to find a technical reference on the algorithm. If I have a bright diffuse object, it seems to me that the relevant quantity is the significance compared to background counting statistics, not the "local background"; for a bright diffuse source, the "local background" is comparable to the source intensity, so csmooth will oversmooth (I conjecture). I wanted to test this using the options to provide a background map and error map, but got stalled because of the problems of generating an error map.

- 125 - Sherpa should be made more general. At present Sherpa does not support for arrays of AREASCAL and BACKSALE while XSPEC does. XMM-Newton RGS data cannot be analyzed with Sherpa.

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URL:
<http://cxc.harvard.edu/ciao3.4/survey/responses/ciaoimprove.html>
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