

*AHELP for CIAO 3.4*

obsvis

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Synopsis

Observation Visualizer

Description

The Observation Visualizer is a tool to aid observation planning allowing inspection of sky images with overlaid instrument fields-of-view (FOVs), as well as plots of observatory roll angle, pitch angle, and target visibility with time.

ObsVis starts with one main GUI screen with menu commands for printing (File: Print), setting observation parameters (Options: Parameters), and viewing information about retrieved stars (Options: Stars). It generates one/both of the following products for the requested sky position: (1) Visibility, Roll+Pitch angles as a function of time (2) FoV superposed on DSS/custom image

VISIBILITY, ROLL + PITCH ANGLES

The visibility, roll + pitch angle are calculated for the specified target position and plotted as a function of time. Visibility is shown by a blue line and the range of allowed roll angles is shown by the green vertical bars. Pitch angle is plotted in red. This information may be useful to determine whether constraints are required for a specific target, and which constraints are feasible. Despite small changes in Chandra spacecraft ephemeris, for a given target, the roll, pitch and visibility are periodic, so these plots are good for any year.

DISPLAY Field of View

The FoV of the selected instrument is superposed on the DSS/custom image of the sky at the requested position in a DS9 display. The instrument FoV and ACA FoV are outlined in blue. For ACIS, each selected chip is labelled. Grating spectra are shown in red. The HEG and MEG arms of the HETG and the + and – sides of both gratings are labelled. Stars for each selected catalog are circled as indicated in the Options:Stars submenu. The requested target position is indicated by a red circle inside a square, the aimpoint (if different) in green and the nominal aimpoint (if different) in blue. The nominal aimpoint is the optimal position for the target on the instrument.

MAIN WINDOW DATA FIELDS

TARGET COORDINATES

Enter RA and Dec coordinates (J2000) of target to be displayed.

TARGET COORDINATES FORMAT SPECIFICATION

Target coordinates should be specified as right ascension and declination in succession. Both RA and Dec can be specified in sexagesimal format (hours/minutes/seconds for RA, degrees/arcminutes/arcseconds for Dec) using either spaces or colons (:) as separators, or in decimal degrees. In addition, RA can be specified in decimal hours by appending either "H" or "h" (do not type the double quotes) to the decimal value. If the RA is specified in sexagesimal format, then the Dec value must be separated from the RA value by a comma or a plus or minus sign, or the degree (or decimal degree) part of the Dec must have a "D" or "d" appended to it, or all three hours/minutes/seconds values must be included. In all other cases, trailing zero values for minutes/seconds (RA) or arcminutes/ arcseconds (Dec) may be dropped. Extra whitespace is always ignored.

String entered	Translation
23 59 59.9999 -89 59 59.999	23 59 59.9999 -89 59 59.999
23:59:59.9999 -89:59:59.999	23 59 59.9999 -89 59 59.999
23.7654, +0.6857	01 35 03.6960 +00 41 08.520
09h 16m 54.28s 32d 15' 6.1"	09 16 54.2800 +32 15 06.100
10.9876h, +14	10 59 15.3600 +14 00 00.000
0, 0	00 00 00.0000 +00 00 00.000
14 12, 16 10	14 12 00.0000 +16 10 00.000
14 12 +16 10	14 12 00.0000 +16 10 00.000
14 12 16d 10	14 12 00.0000 +16 10 00.000
14 12 16 10 AMBIGUOUS	treated as 14 12 16.0000 +10 00 00.000

NAME RESOLVER

Enter a valid target name and click the Resolve Name button. This will query the SIMBAD catalog at <http://simbad.u-strasbg.fr/>. If one, and only one entry is found, the coordinates will be displayed in J2000. If no entry is found or multiple entries are found, a message indicating the result will be displayed and the user can try again.

TARGET NAME

A label to be placed on the roll/pitch/visibility plot.

ROLL

Roll angle of displayed instruments in degrees.

OFFSET-Y

Science instruments' offset y in arcminutes. Target position(red), aimpoint(green), and nominal aimpoint(blue) will be marked on the resulting FOV display. For ACIS-S imaging or grating observations please refer to the RPS help (<http://cxc.harvard.edu/soft/RPS/Chandra/Chandra.help.html>) and/or the POG ACIS chapter (<http://cxc.harvard.edu/proposer/POG/html/>) for the default values for this offset. The defaults for certain configurations are automatically included, but the appropriate value should be verified and may

need to be entered into ObsVis by hand to view the correct FoV for many instrument setups.

OFFSET-Z

Science instruments' offset z in arcminutes. Target position(red), aimpoint(green), and nominal aimpoint(blue) will be marked on the resulting FOV display.

OFFSET-SIMZ

Science instruments' offset simz in arcminutes. Target position(red), aimpoint(green), and nominal aimpoint(blue) will be marked on the resulting FOV display. For ACIS-S imaging or grating observations please refer to the RPS help (<http://cxc.harvard.edu/soft/RPS/Chandra/Chandra.help.html>) and/or the POG ACIS chapter (<http://cxc.harvard.edu/proposer/POG/html/>) for the default values for this offset. The defaults for certain configurations are automatically included, but the appropriate value should be verified and may need to be entered into ObsVis by hand to view the correct FoV for many instrument setups.

OFFSET-SIMZ (mm)

Shows Science instruments' offset simz in millimeters. Read-only field (automatically calculated from OFFSET-SIMZ value).

SCIENCE INSTRUMENT FOV

Shows selected science instrument to be overlaid on top of the sky image. Read-only field. To update, please select the Options: Parameters menu item. Default value is ACIS-I.

GRATING

Shows selected grating type to be overlaid on top of the sky image. Read-only field. To update, please select the Options: Parameters menu item. Default value is NONE.

IMAGE SOURCE

Shows source of the sky images. Read-only field. To update, please select the Options: Parameters menu item. Default value is DSS.

INFO

Displays messages about the status of requests being processed. Read only field.

MAIN WINDOW MENUS

File

Consists of Print and Exit items for printing either display for the current observation (to printer/file) and exiting the application.

Options

Consists of commands to open the PARAMETERS DIALOG BOX and the STARS DIALOG BOX. Parameters allows user setting of observation parameters. Stars displays information about retrieved stars within the Catalog Search Radius. The stars that will actually be used in any observation must satisfy

complicated selection criteria beyond the scope of this tool.

MAIN WINDOW BUTTONS

DISPLAY FIELD OF VIEW

Clicking this button issues a request to display the field of view with the specified parameters. The field of view is displayed in the ds9 imager.

DISPLAY ROLL/PITCH/VISIBILITY

Clicking this button issues a request to display roll, pitch, and visibility. The ChIPS (Chandra Imaging and Plotting System) plotter is used to display the data.

DISPLAY BOTH

Process both field of view and roll/pitch/visibility requests.

CLEAR FORM

Clear the data entries in the main window.

CANCEL REQUEST

Cancel any pending requests.

PRINT DIALOG BOX

Options for printing the field of view image displayed in the ds9 imager or the roll/pitch/visibility plot displayed in the chips plotter to a printer or a specified file on disk.

PARAMETERS DIALOG BOX

Several options for configuring the field of view and roll/pitch/visibility.

CATALOGS

User can select which catalogs should be searched for stars within specified radius around target coordinates. Available catalogs include ROSAT, RASS, WGACAT and ACT/TYCHO. The default is to use all four catalogs.

CATALOG COUNT RATE THRESHOLD

Specify the lower threshold on X-ray count rate for stars retrieved from given catalogs. The default is 0.1 for ROSAT, WGACAT and RASS.

CATALOG MAGNITUDE THRESHOLD

Specify the upper (faint) threshold on optical magnitude for stars retrieved from given catalogs. The default value is 10.5 for ACT/TYCHO.

CATALOG SEARCH RADIUS

This radius is used to restrict the sky region within which a search of the given catalog is performed. Valid radius range is from 0 to 180 arcminutes. The default is 90 arcminutes.

GRATING TYPE

Select grating to be used: None, HETG or LETG. The default is NONE. When the grating selection is changed, the offsets will be set to the default specified for the instrument–grating combination.

START/END DATES

Date range used in processing of roll/pitch/visibility request. The range defaults to estimated dates for current cycle. To edit, type a number over the existing numbers.

ACA FIELD OF VIEW

Select ACA instrument to be overlaid on top of sky image. The default is to have ACA checked.

FIELD OF VIEW

Select Chandra science instrument to be overlaid on top of the sky image: ACIS–I, ACIS–S, HRC–I, HRC–S. When the instrument selection is changed, the offsets will be set to the default specified for the instrument–grating combination. When overlaying ACIS–I or ACIS–S, ObsVis will automatically select the default CCD configuration for each. Any number of chips can then be added or subtracted from the overlay. Note that any configuration of more than six chips is invalid for Chandra, and is allowed here for visualization purposes only. Standard or custom sub–arrays may also be selected for the ACIS chips. Choices for subarrays are None, 1/2, 1/4, 1/8, and Custom. For custom sub–arrays, start and rows are restricted as follows: $0 \leq \text{start} \leq 895$, $128 \leq \text{rows} \leq 1023$, and $0 \leq \text{start} + \text{rows} \leq 1023$. The default setting is ACIS–I, chips I0, I1, I2, I3, S2, S3, with no sub–array.

IMAGE SELECTION

Select the source of sky images: DSS (Digitized Sky Survey) or Custom Image. DSS images are the default and are retrieved from the server running at the Smithsonian Astrophysical Observatory. User can change the size of the image retrieved. Custom images are specified by the user by file path and loaded from the local file system. Images loaded into DS9 can be saved with full FITS header information by using the DS9 options File/Export Data As.../FITS

CLOSE BUTTON

Closes the dialog box. Changes made to the entry fields do not take effect and are discarded if the apply button has not been selected.

APPLY BUTTON

Applies changes made in entry fields and they become permanent.

STARS DIALOG BOX

This dialog box contains a listing of the stars retrieved from the selected catalogs while processing the last field of view request. The following information about each star is contained in the list: CATALOG NAME,

COLOR in the ds9 imager, STAR ID, RA in degrees, DEC in degrees, and COUNT or MAGNITUDE depending on the catalog. Clicking with the left mouse button on any of the rows in the list causes the ds9 imager to display info about that star on the sky image. Clicking again on the same row removes the star info from the sky image. Multiple stars can be selected this way. Also every time a row in the list is selected, it can be pasted to another application using the middle mouse button.

OBSVIS FUNCTIONALITY IN DS9 IMAGER

The ds9 imager displays the field of view. It contains a pull-down menu called OBSVIS with various parameters to configure the displayed science instruments.

STAR INFO

After selecting this menu option, user can click the left mouse button on the displayed star/circle. The imager then will print the star's id next to it, and the ObsVis STARS DIALOG BOX will pop-up with the star's entry selected. Clicking on the selected star again will remove information from the image and will deselect the star from the STARS DIALOG BOX.

MOVE ALL

User can select this menu item and can click(drag) with left mouse button on the image that will designate new target point. All instruments are moved appropriately and new coordinates are reflected back in ObsVis.

MOVE OFFSET Y/Z

User can select this menu item and can click(drag) with left mouse button on the image that will move parts of the science instruments assembly(target point and grating are not moved) modifying offset y and/or z. The aim point is green. Offset changes are reflected in ObsVis in real-time.

MOVE OFFSET SIMZ

User can select this menu item and can click(drag) with left mouse button on the image that will move parts of the science instruments assembly modifying offset simz. The new offset is reflected in ObsVis in real-time.

ROLL

Selecting and dragging mouse with left button pressed around the aim point causes the entire science instrument assembly to rotate around the aim point. The roll angle is reflected in ObsVis in real-time.

SNAPSHOT

Takes a snapshot of the current configuration of the instruments. The snapshot is displayed in different color.

RESET

Resets all offsets and the roll angle to their original positions. Reset values are reflected in ObsVis.

NOTES

If ObsVis spawns multiple ds9 windows when displaying a field of view, try setting the environment variable ASCDS_LAUNCH_WAIT to a value greater than 30.

ASCDS_LAUNCH_WAIT, specified in seconds, tells ObsVis how long to wait for ds9 to start before giving up and starting another one.

See Also

proposaltools

[colden](#), [dates](#), [pimms](#), [precess](#), [prop-coords](#), [prop-time](#), [prop-tools](#)

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URL:
<http://cxc.harvard.edu/ciao3.4/obsvis.html>
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