

The EIS Planning Tool User's Guide

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Introduction

About This Guide

A planning guide will develop here over the coming weeks. As our understanding of the instrument grows, this guide will inevitably — and desirably — develop. This naturally lends itself to a TWiki platform, although a PDF version is planned for each significantly new version.

N.B. This is a work in progress. Please ignore until it is linked from the [SolarB WebHome](#)

Software Requirements

In order to run the EIS planning software, you will need:

1. `IDL`; the planning tool is developed under Linux, but works under Windows XP and Mac OS X, too.
2. an up-to-date installation of `SolarSoft`, including the EIS branch of the SSW tree.

Structure of a Study

An EIS *study* is composed of one or more *rasters*, each of which is defined in part by a *line list*. To those with past experience of [preparing a SoHO CDS study](#), this nomenclature may well be familiar. However, it is worth explaining both for those who are new to the concept of studies, **and** for those new to EIS.

Line Lists

A line list is simply a list of wavelengths (in *angstroms*) at which the instrument is to observe, along with an identifier (or name) for that wavelength (typically, the ion species which produces it, but this can be customised). No information about the spectral range around

each wavelength is assumed.

For example, the [core line list of EIS](#) could be expressed as follows:

Name Wavelength

Ca XVII 192.82

Fe XII 195.12

He II 256.32

This line list thus consists of three lines, with ion names for each.

Rasters

In EIS nomenclature, the term *raster* covers both possible forms of observation:

- **Scanning rasters**, which are made by building up slit (or slot) images across an area from west to east, thereby achieving spatial coverage in the west-east direction (the slit of EIS is oriented the north-south direction). Such observations can be thought of as having dimensions of x , y and λ .
- **Sit & stare** observations, which are successive slit/slot exposures at the same nominal position on the Sun. These are observations in x , y and t .

Altogether, the definition of a raster is determined by several parameters:

1. which line list to use
2. which slit/slot to observe through
3. the width of each spectral window
4. what exposure duration(s) should be used
 - a. more than one exposure time can be specified: this is useful if, for example, more than one lines is to be observed, but one is much stronger than the rest.
5. whether it is a scanning or sit'n'stare raster
 - a. if it is a scanning raster:
 - i. how many steps to make in the x direction
 - ii. how wide these steps should be
 - b. if it is a sit'n'stare raster
 - i. how many times the exposure(s) should be repeated
6. a unique name, or "acronym", such as `NRL_FLARE_EVAP`.

Studies

A study* can be most simply defined as consisting of one or more rasters grouped together in a particular order for some science objective.

For a study to be completely defined, we must specify

1. the order in which component rasters are to be run
2. how often each raster is to be repeated
3. what instrument triggers will be enabled/acknowledged
4. what compression scheme (if any) is to be used
5. a unique acronym, as is also true for rasters ([see above](#))

(*Note that, to reduce confusion of terminology between "study" and "sequence" within EIS, the term "sequence" refers only to low-level engineering commands.)

A Quick Word on the Timeline

Again, this concept will be familiar to former CDS planners, but it is relatively self-explanatory to others, too.

The **timeline** is the interface which allows the scheduling of studies for a given 24-hour period. However, as this will currently only be used by EIS Chief Observers (COs), we won't go into it in this guide as yet.

Preparing a Raster

Starting the Raster Tool

Once you have started your `solarsoft` IDL session, you can begin creating your raster by typing `eis_mk_raster`. You should now be presented with a graphical user interface (or "widget" in IDL speak) that looks something like this:



This represents a default raster ([Raster ID #000001](#)), which is loaded in when the raster tool is started. You'll see that it contains just the three core lines in its line list (7). On the left is the Line List area (2):

- (3) the **Linelist ID** ([#000001](#))
- (4) the Linelist name, or **acronym** (`Core_Lines`)
- (5) the date the Linelist was saved, and
- (6) the person who saved it. In this case, Matt.

The panel to its right (7) contains the most scientifically important information, namely:

- the wavelength of interest (in effect, this is the central wavelength of the spectral range or "window" that you're interested in)
- the name of that window (typically the ion of interest)
- the CCD on which each wavelength falls
 - (16) CCD 1: 170 - 210 Å
 - (17) CCD 2: 230 - 270 Å
- the width (in pixels) of each spectral window

The information on the far right, under **Selected Line** (8) is initially greyed-out because it is line-specific, and no line has yet been selected. Click on the first line in the list (Ca XVII), and you should see this area activated. You should also see the corresponding spectral window highlighted in yellow in the synthetic CCD 1 image (16) below.

The screenshot shows the EIS Make Raster Tool interface. The window title is "EIS Make Raster Tool". The interface includes a menu bar (Exit, Linelist, Raster, Plot, Edit) and several panels:

- Line List:** A table with columns: #, Wavelength(Å), Name, Pixel, CCD, Width. The first row is highlighted in red: #1, 192.82 (c), Ca XVII, 1189, 1, 32.
- Selected Line:** A section on the right with fields for Pixels (1173), Wavelength (192.47), Width (32), Name (Ca XVII), and Text (custom).
- Colour Table:** A dropdown menu set to "RED-PURPLE".
- Spectral Plot:** A plot showing a wavelength axis from 100 to 210 Å. A yellow vertical bar highlights the spectral window around 1189 Å.
- Control Fields:** Slit/slot selection (1), Raster Type (Scanning), Window height (512), Default width (32), Number of exposures/step (1), Exposure time (50.00), Number of Fine Mirror steps (40), Step size (2).
- Raster Information:** Raster ID (000001), Acronym (Default Raster), Author (John Rainnie), Created (26-May-2006), Duration (35m33s), Volume (31488 kBits), Data rate (15.1113 kBits/s), Title.

The **Selected Line** section will now let you set a number of parameters related to the spectral window. The area labelled **Pixels** (9) lets you adjust the position of the centre of the window on the detector. Alternatively you can do this in wavelength (10). In either case, the numbers to the left and right of the field represent the lower and upper limits to the spectral window (in CCD pixel and wavelength units, respectively). Before launch, the translation between pixel co-ordinates and angstroms is done using a simple linear relation. After EIS is commissioned, this will be calibrated using real data, and the wavelength calibration will be regularly monitored and updated.

Also, note that — as with all editable IDL text widget fields, **YOU MUST PRESS ENTER ONCE YOU HAVE TYPED THE VALUE YOU WANT**; otherwise, the widget will simply not process your desired value and your efforts will go unnoticed by the system.

To adjust the spectral width of the window, use the slider (11) to choose a value, measured in units of pixels. For on-board software reasons, you can only choose integer multiples of 8 pixels. The default value is 32 pixels, which is pretty generous: in the middle of CCD 1 (190 Å) this is about $\pm 400 \text{ km s}^{-1}$; in the middle of CCD 2, around $\pm 250 \text{ km s}^{-1}$. But you may want to increase or decrease this for science or telemetry reasons.

Another option, although you probably won't often want to do this, is to select half a CCD as your spectral window. This is the biggest possible window, since EIS has two read-out nodes per CCD, located at opposite ends of the CCD: it therefore normally reads only half a CCD from each node.

_If you want to adjust all the spectral windows at once to the same width, read below... _

Finally you have the option of changing the name of the spectral window. If you're dealing with a core line, then you don't need to change this. However if you've added a line, particularly a custom line, you should check that it is appropriately named.

Making a Line List

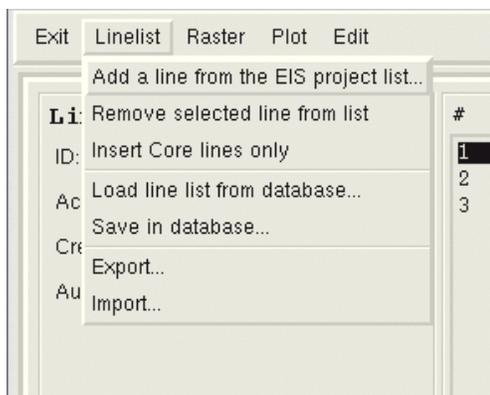
The first step in creating an observation is to decide in which wavelengths — or which wavelength ranges — you want to observe.

Be aware that the core line list [above](#) **must** be included in all observations. This is because standard data products (line-intensity, doppler-shift, and line-width maps — known as Level 2 FITS) will be made from all EIS observations in a data pipeline; these products will be used to browse data in the online catalogue. (If you don't include the core lines in your linelist, you'll have it sent back to you by the **Scientific Schedule Co-ordinators (SSCs)**.) These core lines are marked **(c)** in (7).

Adding a Project Line

The EIS mission has certain expected lines from which you can choose to help you put together a line list. To add one of these **project lines** to your line list (which is probably the first thing you'll want to try), go to the main menu (1) and choose *Edit, Add a line from the EIS project list...*

The main linelist menu



This opens up a new window with a list of wavelengths and the ions which emit them:

By default, these known lines are ordered by wavelength, but you can change that by clicking on **Ascending Wavelength** and changing it to, for example, **Ascending Name**.

This orders the ion species alphabetically (not by atomic number or roman numeral order, but its' enough to let you search for the ion you want):

Wavelength	Type	Atomic Name
180.400	p	Fe XI
180.730	p	S X
184.540	p	Fe X
185.210	p	Fe VIII
185.230	p	Ni XVI
186.600	p	Fe VIII
186.850	p	Fe XII
186.880	p	Fe XII
187.890	p	Fe XXI
187.970	p	Ar XIV
188.230	p	Fe XI
190.040	p	Fe X
191.050	p	Fe XII
191.400	p	Ar XIV
192.040	p	Fe XXIV
192.390	p	Fe XII
192.820	c	Ca XVII
192.900	p	O V
193.520	p	Fe XII
193.870	p	Ca XIV
194.020	p	Ni XVI
194.390	p	Ar XIV
194.660	p	Fe VIII
195.120	c	Fe XII
195.280	p	Ni XVI
195.970	p	Fe VIII
196.540	p	Fe XIII
196.650	p	Fe XII
196.810	p	S X
200.020	p	Fe XIII

Sort:

Add Dismiss

Wavelength	Type	Atomic Name
187.970	p	Ar XIV
191.400	p	Ar XIV
194.390	p	Ar XIV
192.820	c	Ca XVII
193.870	p	Ca XIV
200.980	p	Ca XV
180.400	p	Fe XI
184.540	p	Fe X
185.210	p	Fe VIII
186.600	p	Fe VIII
186.850	p	Fe XII
186.880	p	Fe XII
187.890	p	Fe XXI
188.230	p	Fe XI
190.040	p	Fe X
191.050	p	Fe XII
192.040	p	Fe XXIV
192.390	p	Fe XII
193.520	p	Fe XII
194.660	p	Fe VIII
195.120	c	Fe XII
195.970	p	Fe VIII
196.540	p	Fe XIII
196.650	p	Fe XII
200.020	p	Fe XIII
201.130	p	Fe XIII
202.040	p	Fe XIII
202.830	p	Fe XIII
204.650	p	Fe XVII
247.160	p	Fe XXII

Sort:

Add Dismiss

You're not limited to selecting one line at a time, either.

To select multiple lines, click and drag over a range

To select non-adjacent lines, hold down the **CTRL** key, and left-click on

But we'll just concentrate on adding a single line of **Ca xv** for now
(you can also add a single line by double-clicking on it).

Wavelength	Type	Atomic Name
200.980	p	Ca XV
180.400	p	Fe XI
184.540	p	Fe X
185.210	p	Fe VIII
186.600	p	Fe VIII
186.850	p	Fe XII
186.880	p	Fe XII
187.890	p	Fe XXI
188.230	p	Fe XI
190.040	p	Fe X
191.050	p	Fe XII
192.040	p	Fe XXIV
192.390	p	Fe XII
193.520	p	Fe XII
194.660	p	Fe VIII
195.120	c	Fe XII
195.970	p	Fe VIII
196.540	p	Fe XIII
196.650	p	Fe XVII
200.020	p	Fe XIII
201.130	p	Fe XIII
202.040	p	Fe XIII
203.830	p	Fe XIII
204.650	p	Fe XVII
247.160	p	Fe XXII
251.070	p	Fe XVI
251.960	p	Fe XIII
253.160	p	Fe XXII
254.870	p	Fe XVII
255.100	p	Fe XXIV

Sort: Ascending name

Add Dismiss

Wavelength	Type	Atomic Name
200.980	p	Ca XV
180.400	p	Fe XI
184.540	p	Fe X
185.210	p	Fe VIII
186.600	p	Fe VIII
186.850	p	Fe XII
186.880	p	Fe XII
187.890	p	Fe XXI
188.230	p	Fe XI
190.040	p	Fe X
191.050	p	Fe XII
192.040	p	Fe XXIV
192.390	p	Fe XII
193.520	p	Fe XII
194.660	p	Fe VIII
195.120	c	Fe XII
195.970	p	Fe VIII
196.540	p	Fe XIII
196.650	p	Fe XVII
200.020	p	Fe XIII
201.130	p	Fe XIII
202.040	p	Fe XIII
203.830	p	Fe XIII
204.650	p	Fe XVII
247.160	p	Fe XXII
251.070	p	Fe XVI
251.960	p	Fe XIII
253.160	p	Fe XXII
254.870	p	Fe XVII
255.100	p	Fe XXIV

Sort: Ascending name

Add Dismiss

Wavelength	Type	Atomic Name
187.970	p	Ar XIV
191.400	p	Ar XIV
194.390	p	Ar XIV
192.820	c	Ca XVII
193.870	p	Ca XIV
200.980	p	Ca XV
180.400	p	Fe XI
184.540	p	Fe X
185.210	p	Fe VIII
186.600	p	Fe VIII
186.850	p	Fe XII
186.880	p	Fe XII
187.890	p	Fe XXI
188.230	p	Fe XI
190.040	p	Fe X
191.050	p	Fe XII
192.040	p	Fe XXIV
192.390	p	Fe XII
193.520	p	Fe XII
194.660	p	Fe VIII
195.120	c	Fe XII
195.970	p	Fe VIII
196.540	p	Fe XIII
196.650	p	Fe XVII
200.020	p	Fe XIII
201.130	p	Fe XIII
202.040	p	Fe XIII
203.830	p	Fe XIII
204.650	p	Fe XVII
247.160	p	Fe XXII

Sort: Ascending name

Add Dismiss

In all the cases above, you can add the lines you've chosen by hitting **Add**. **Dismiss** will get rid of the window without adding any lines (unless you've double-clicked on a line).

Adding a Custom Line

There will be certain cases where you want to add a line which isn't in the EIS project list, for example:

- the line you want isn't there;
- you want to include more than one line, or a piece of continuum, so the notation needs to be a custom one.

In any of these cases, the easiest thing to do is to add a project line and then customise the wavelength accordingly. (Remember that *the line list only contains the wavelengths*, not how wide the spectral windows are.)

In this example, we'll start by adding the `s x` project line at 180.73 Å, following the steps above.

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000001
 Acronym: Core_Lines
 Created: 26-Apr-2006
 Author: Matthew Whillock

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	180.73 (p)	S X	646	1	32
2	192.82 (c)	Ca XVII	1189	1	32
3	195.12 (c)	Fe XII	1292	1	32
4	200.98 (p)	Ca XV	1555	1	32
5	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 630 : 646 : 661
 Wavelength: 180.37 : 180.73 : 181.06
 Width: 32 Full Range
 Name: Spectral notation
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare

Window height (pixels): 512 Default width (pixels): 32

Number of exposures/step: 1 Exposure(Delay) time s(ms): 50.00(10)

Number of Fine Mirror steps: 40 Step size: 2 (Number of exposures = 41)

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 35m33s **Volume:** 52480 kBits **Data rate:** 25.1854 kBits/s
Title: [RA:000001] [Scan:40(2*)steps] [ss:1*] [wH:512,nWins:5,LL:000001] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

We'll now move the central wavelength to 180.20 Å:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000001
 Acronym: Core_Lines
 Created: 26-Apr-2006
 Author: Matthew Whillock

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	180.20 (p)	S X	623	1	32
2	192.82 (c)	Ca XVII	1189	1	32
3	195.12 (c)	Fe XII	1292	1	32
4	200.98 (p)	Ca XV	1555	1	32
5	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 607 : 623 : 638
 Wavelength: 179.85 : 180.20 : 180.54
 Width: 32 Full Range
 Name: Spectral notation S X
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Sil'n'Stare

Window height (pixels): 512 Default width (pixels): 32 Set all

Number of exposures/step: 1 Set Exposure/Delay Times... Exposure(Delay) time s(ms): 50.00(10)

Number of Fine Mirror steps: 40 Step size: 2 (Number of exposures = 41)

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 35m33s **Volume:** 52480 kBits **Data rate:** 25.1854 kBits/s
Title: [RA:000001] [Scan:40(2*)steps] [ss:1*] [wH:512,nWins:5,LL:000001] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

...and adjust the width of the window to 80 pixels, to create a wider spectral window than the four others:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000001
Acronym: Core_Lines
Created: 26-Apr-2006
Author: Matthew Whillock

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	180.20 (p)	S X	623	1	80
2	192.82 (c)	Ca XVII	1189	1	32
3	195.12 (c)	Fe XII	1292	1	32
4	200.98 (p)	Ca XV	1555	1	32
5	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 583 : 623 : 662
Wavelength: 179.32 : 180.20 : 181.08
Width: 80 Full Range
Name: Spectral notation S X
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Sil'n'Stare

Window height (pixels): 512 Default width (pixels): 32 Set all

Number of exposures/step: 1 Set Exposure/Delay Times... Exposure(Delay) time s(ms): 50.00(10)

Number of Fine Mirror steps: 40 Step size: 2 (Number of exposures = 41)

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 35m33s **Volume:** 68224 kBits **Data rate:** 32.7411 kBits/s
Title: [RA:000001] [Scan:40(2*)steps] [ss:1*] [wH:512,nWins:5,LL:000001] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

And finally, we rename the window. This is done by going to the window's **Name** field (12) and clicking on **Text (custom)**.

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000001
 Acronym: Core_Lines
 Created: 26-Apr-2006
 Author: Matthew Whillock

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	180.20 (p)	S X	623	1	80
2	192.82 (c)	Ca XVII	1189	1	32
3	195.12 (c)	Fe XII	1292	1	32
4	200.98 (p)	Ca XV	1555	1	32
5	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 583 : 623 : 662
 Wavelength: 179.32 : 180.20 : 181.08
 Width: 80 Full Range
 Name: 8 chars max
 Spectral notation
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Sil'n'Stare

Window height (pixels): 512 Default width (pixels): 32 Set all

Number of exposures/step: 1 Set Exposure/Delay Times... Exposure(Delay) time s(ms): 50.00(10)

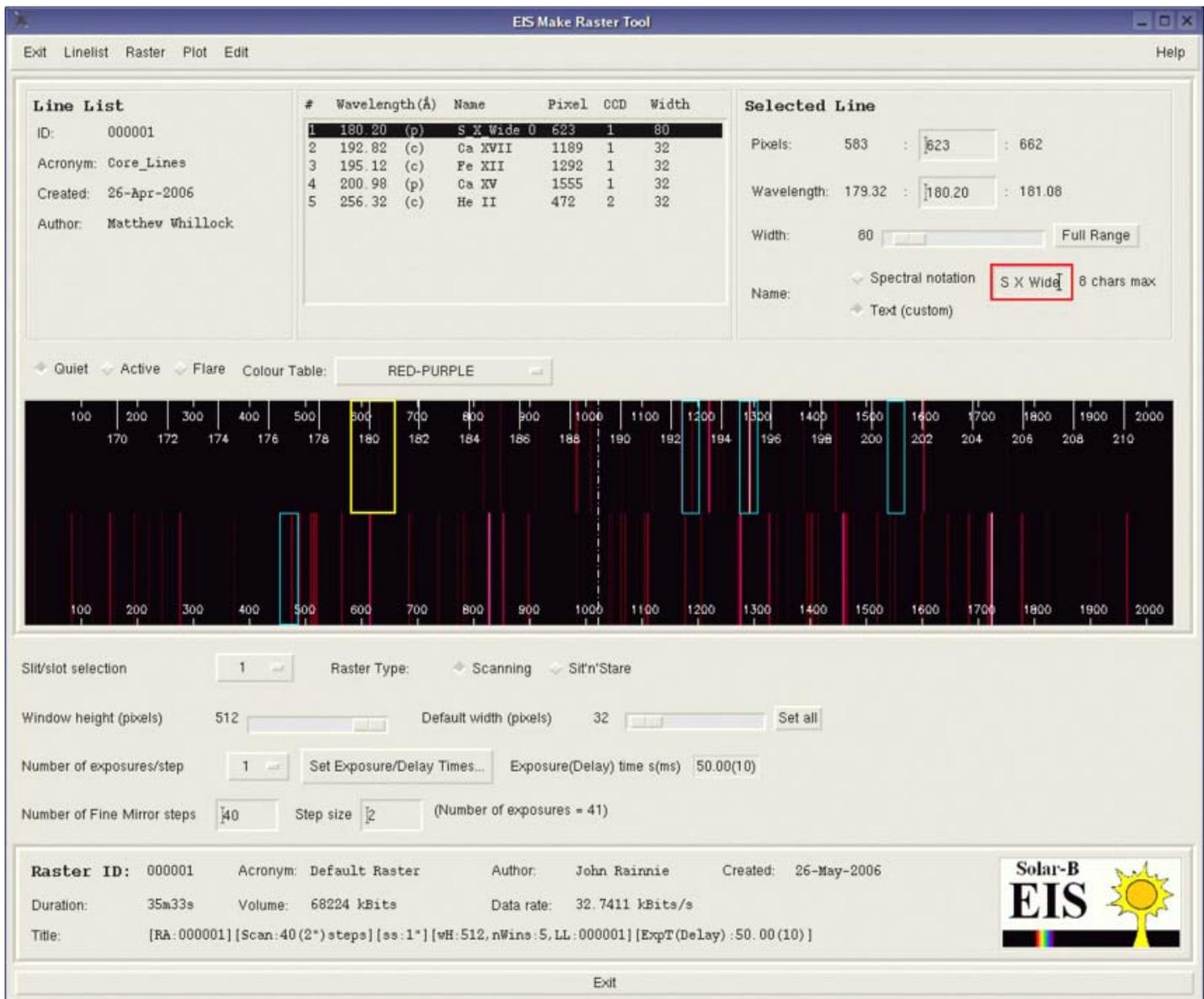
Number of Fine Mirror steps: 40 Step size: 2 (Number of exposures = 41)

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 35m33s **Volume:** 68224 kBits **Data rate:** 32.7411 kBits/s
Title: [RA:000001] [Scan:40(2*)steps] [ss:1*] [wH:512,nWins:5,LL:000001] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

Here, you enter a name for the window, up to 8 characters long (this can include spaces). In this case, I've chosen "S X Wide", as I've just widened the window, but as long as the name is self-explanatory (you mightn't be the only one using this data, remember!), it should be fine.



Removing a Line from the Line List

If you want to remove a line, you have two options:

- from the main Linelist menu in (1), choose *Linelist, Remove selected line from list* ; or
- right-click on the line in (7) and choose *Remove line* :

We can now select the custom line we created above, and right-click on it to bring up the *Remove* option. Note that this will only work on the selected (i.e. highlighted) line, not simply on whichever line you right-click on.

Line List

ID	Wavelength (Å)	Name	Pixel	CCD	Width
000001	180.20 (p)	S X Wide 0	623	1	80
2	192.82 (c)	Ca XVII	1	Remove line	32
3	195.12 (c)	Fe XII	1292	1	32
4	200.98 (p)	Ca XV	1555	1	32
5	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 583 : 623 : 662

Wavelength: 179.32 : 180.20 : 181.08

Width: 80 Full Range

Name: 8 chars max

☐ Spectral notation
☐ Text (custom)

☐ Quiet ☐ Active ☐ Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning ☐ Slit'n'Stare

Window height (pixels): 512 Default width (pixels): 32

Number of exposures/step: 1 Exposure(Delay) time s(ms): 50.00(10)

Number of Fine Mirror steps: 40 Step size: 2 (Number of exposures = 41)

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006

Duration: 35m33s **Volume:** 68224 kBits **Data rate:** 32.7411 kBits/s

Title: [RA:000001] [Scan:40(2*)steps] [ss:1*] [wH:512,nWins:5,LL:000001] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

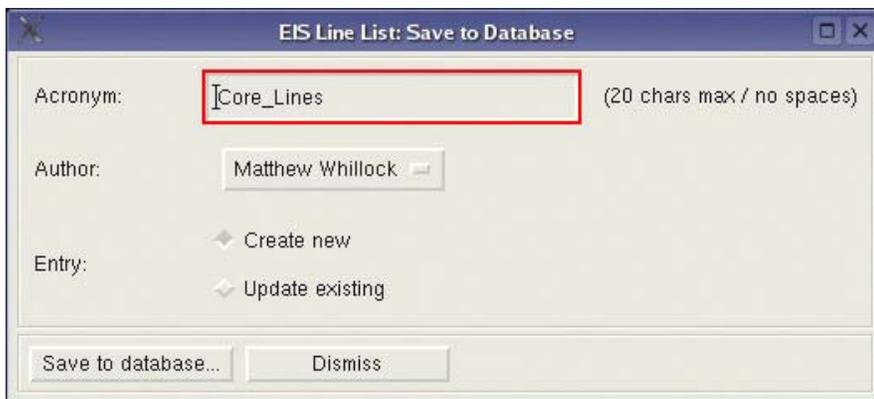
Saving a Line List

Once you've settled on a line list, you can save it for future use so that you don't have to keep entering the same parameters over and over every time you want to create a study. To save a line list, once it's been created, go to the main Linelist menu in (1), and choose Save in Database:

Linelist Raster Plot Edit

- Add a line from the EIS project list...
- Remove selected line from list
- Insert Core lines only
- Load line list from database...
- Save in database...
- Export...
- Import...

You'll then be presented with a dialogue box to fill in the information, which has some default information — you'll need to replace this, of course:



EIS Line List: Save to Database

Acronym: (20 chars max / no spaces)

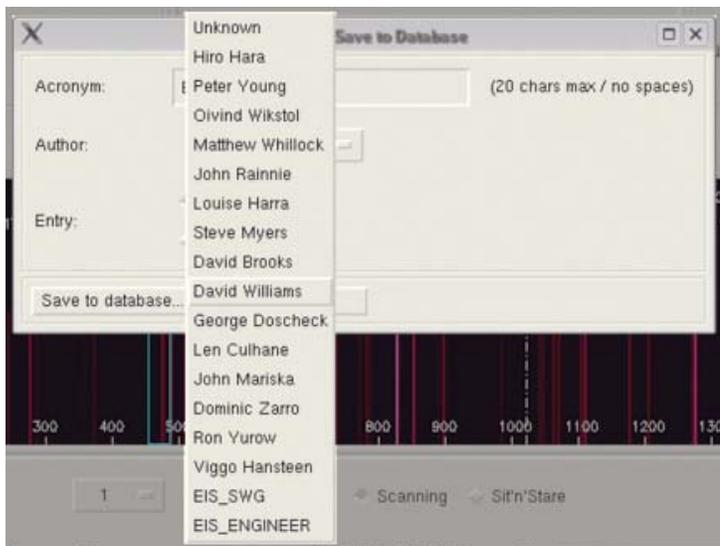
Author:

Entry:

Create new

Update existing

If your name is in the existing list of people associated with making EIS studies, then you can select it from the drop-down menu:



EIS Line List: Save to Database

Acronym: (20 chars max / no spaces)

Author:

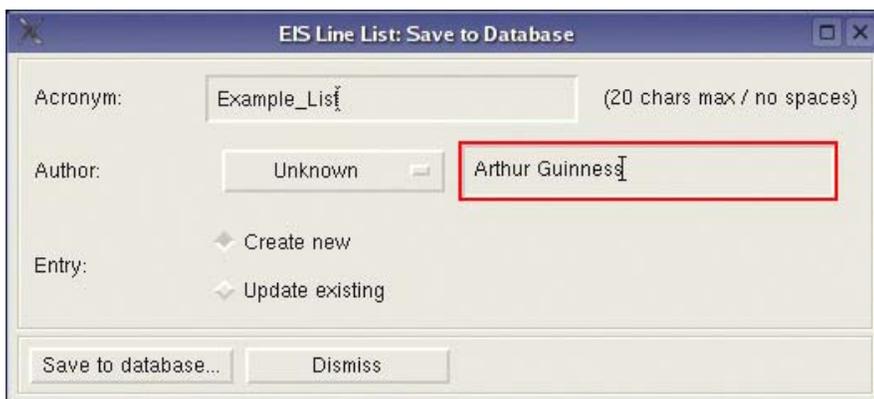
Entry:

Create new

Update existing

- Unknown
- Hiro Hara
- Peter Young
- Orvind Wikstol
- Matthew Whillock
- John Rainnie
- Louise Harra
- Steve Myers
- David Brooks
- David Williams
- George Doscheck
- Len Culhane
- John Mariska
- Dominic Zarro
- Ron Yurow
- Viggo Hansteen
- EIS_SWG
- EIS_ENGINEER

Otherwise, select *Unknown* from the list and enter your own name. Please keep this the same from one time to the next, as we would like the linelist database (and others) to be searchable by the author's name.



EIS Line List: Save to Database

Acronym: (20 chars max / no spaces)

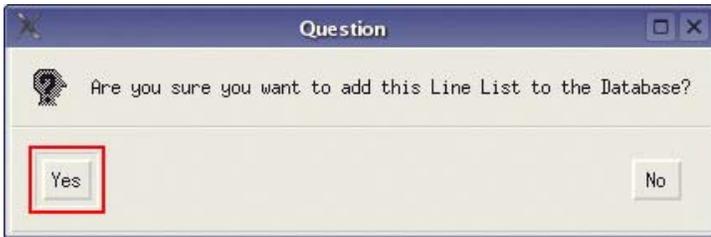
Author:

Entry:

Create new

Update existing

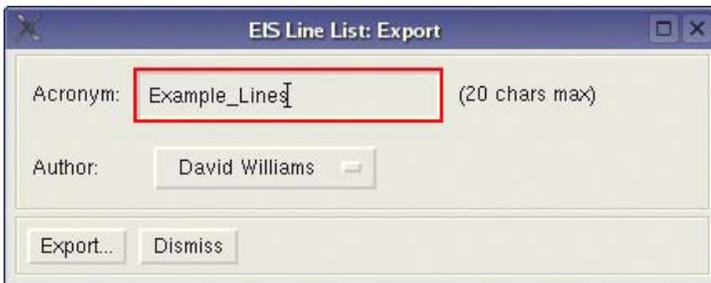
Once you've filled in this information, choose *Save* and you'll be asked if you're sure.



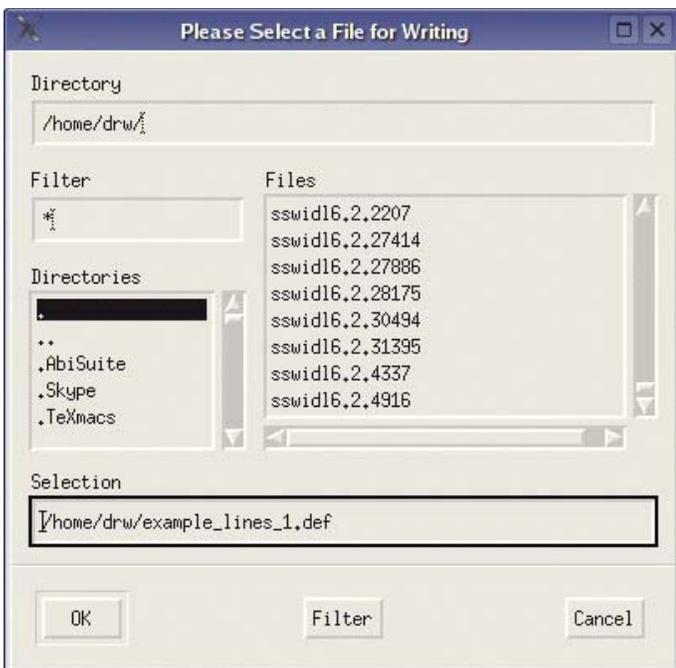
If you *are* sure, then click *Yes*. (The converse, naturally, also applies...)

Exporting a Line List

To submit a line list to the SSCs for inclusion in the official database, you need to export your choice of wavelengths to an ASCII text file. This is done by going to the main menu (1) again and choosing *Linelist, Export...* You'll then be presented with a dialogue box asking you for an **Acronym** for the line list, and an author (as for saving a linelist, above).



When you select *Export...*, you'll be asked where to save the linelist file (which, by default, is given a *.def* extension). The Raster Tool will come up with a filename based on your acronym, but you can change this to whatever you want.



Finally, click *OK* to save your list to the specified file.

* The example linelist is now saved:



Importing a Line List

This is just the inverse of exporting a linelist, and is useful if you want to see a linelist that someone else has created, but that isn't necessarily in the official database. *It's pretty straight-forward, but I'll fill in the details on this later.*

Changing the CCD image

Before launch, only synthetic CCD (i.e. full-spectrum) images are available, and this is what this guide will feature until the post-commissioning phase.

(Insert a bit more chat about this)

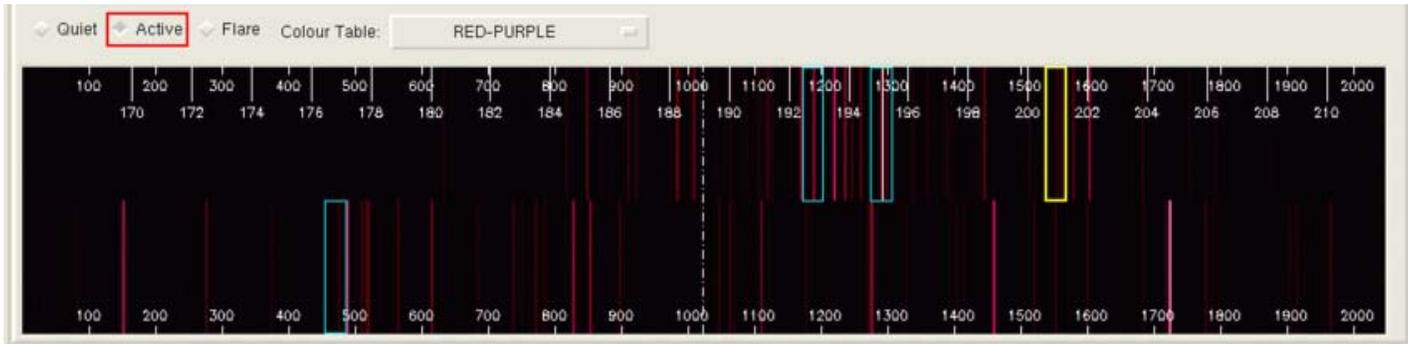
- Active Region & Flare spectra
- SERTS already-observed spectra?
- EIS commissioning spectra (spectral atlas)

Note that when you change colour tables, the spectrum silently defaults back to the Quiet Sun image -- you need to change this manually to make sure you're looking at the right kind of spectrum.

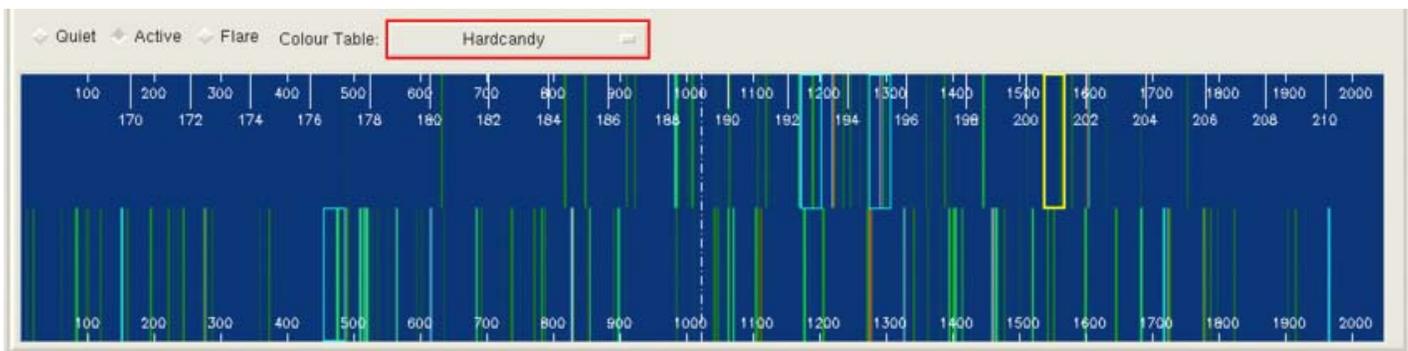
The spectra which are currently available are CHIANTI-derived synthetic spectra, and there are three types from which to choose:

1. Quiet (Quiet Sun)
2. Active (Active Region)
3. Flare

For now, try changing the type from *Quiet* to *Active*.



You can also change the colour table in order to see fainter (or brighter) lines more clearly. For example, the *Hardcandy* table:



Making a Raster

Changing the type of raster

This is easy enough to do, but it has a knock-on effect. For the purposes of this example we'll work with a *Sit'n'Stare* raster. To do this, go to the *Raster Type* section (19) and choose *Sit'n'Stare*. You'll notice that some of the fields below change, namely:

Scanning Raster

Sit'n'Stare Raster

Number of exposures/step Number of exposures/set

Number of Fine Mirror steps Number of sets

Change the type of raster to *Sit'n'Stare*:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000000
 Acronym: Example_Lines
 Created: 20-Jun-2006 J
 Author: David

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	32
2	195.12 (c)	Fe XII	1292	1	32
3	200.98 (p)	Ca XV	1555	1	32
4	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 1539 : 1555 : 1570
 Wavelength: 200.63 : 200.98 : 201.32
 Width: 32 Full Range
 Name: Spectral notation Ca XV
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare

Window height (pixels): 512 Default width (pixels): 32 Set all

Number of exposures/set: 1 Set Exposure/Delay Times... Exposure(Delay) time s(ms): 50.00(10)

Number of exposure sets: 1 Duration (s): 50.010

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 53s **Volume:** 1024 kBits **Data rate:** 19.6569 kBits/s
Title: [RA:000001] [SNS:1set] [ss:1°] [vH:512,nWins:4,LL:000000] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

This is simply logical, and we'll explain the terminology as we go on.

Making a Study

Notes

Just to keep track of things, I've appended some notes below.

- Only one response study possible per trigger type, between real-time (*i.e.* commanding) contacts
 - *E.g.* , If two studies in the timeline are sensitive to the EIS flare trigger, they must both respond with the same response study. There is only room for one set of EIS Flare Trigger response properties in the EIS ICU.

The same goes for the XRT flare trigger, EIS event trigger and the Automatic Exposure Control.

-- [DaveWilliams](#) - 20 Jun 2006

* Change the height of the slit image:

Line List

ID	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	32
2	195.12 (c)	Fe XII	1292	1	32
3	200.98 (p)	Ca XV	1555	1	32
4	256.32 (c)	He II	472	2	32

Selected Line

Pixels: 1539 : 1555 : 1570
 Wavelength: 200.63 : 200.98 : 201.32
 Width: 32 Full Range
 Name: Spectral notation Ca XV
 Text (custom)

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare
 Window height (pixels): 360 Default width (pixels): 32 Set all
 Number of exposures/set: 1 Set Exposure/Delay Times... Exposure(Delay) time s(ms): 50.00(10)
 Number of exposure sets: 1 Duration (s): 50.010

Raster ID: 000001 Acronym: Default Raster Author: John Rainnie Created: 26-May-2006
 Duration: 53s Volume: 720 kBits Data rate: 13.8697 kBits/s
 Title: [RA:000001][SNS:1set][ss:1*][vH:360,nWins:4,LL:000000][ExpT(Delay):50.00(10)]

Solar-B EIS

* Change the width of all the spectral windows:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000000
 Acronym: Example_Lines
 Created: 20-Jun-2006 J
 Author: David

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	72
2	195.12 (c)	Fe XII	1292	1	72
3	200.98 (p)	Ca XV	1555	1	72
4	256.32 (c)	He II	472	2	72

Selected Line

Pixels: 1519 : 1555 : 1590
 Wavelength: 200.18 : 200.98 : 201.76
 Width: 72 Full Range
 Name: Spectral notation Ca XV
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare

Window height (pixels): 360 Default width (pixels): 72 **Set all**

Number of exposures/set: 1 Set Exposure/Delay Times... Exposure(Delay) time s(ms): 50.00(10)

Number of exposure sets: 1 Duration (s): 50.010

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 53s **Volume:** 1620 kBits **Data rate:** 31.1912 kBits/s
Title: [RA:000001] [SNS:1set] [ss:1*] [vH:360,nWins:4,LL:000000] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

* Changing the width of only the Ca XV window:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000000

Acronym: Example_Lines

Created: 20-Jun-2006 J

Author: David

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	72
2	195.12 (c)	Fe XII	1292	1	72
3	200.98 (p)	Ca XV	1555	1	96
4	256.32 (c)	He II	472	2	72

Selected Line

Pixels: 1507 : 1555 : 1602

Wavelength: 199.91 : 200.98 : 202.03

Width: 96 Full Range

Name: Spectral notation

Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare

Window height (pixels): 360 Default width (pixels): 72

Number of exposures/set: 1 Exposure(Delay) time s(ms): 50.00(10)

Number of exposure sets: 1 Duration (s): 50.010

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006

Duration: 53s **Volume:** 1755 kBits **Data rate:** 33.7905 kBits/s

Title: [RA:000001] [SNS:1set] [ss:1*] [vH:360,nWins:4,LL:000000] [ExpT(Delay):50.00(10)]

Solar-B EIS

Exit

* Changing the number of different exposure durations per exposure "set":

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000000
Acronym: Example_Lines
Created: 20-Jun-2006 J
Author: David

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	72
2	195.12 (c)	Fe XII	1292	1	72
3	200.98 (p)	Ca XV	1555	1	96
4	256.32 (c)	He II	472	2	72

Selected Line

Pixels: 1507 : 1555 : 1602
Wavelength: 199.91 : 200.98 : 202.03
Width: 96 Full Range
Name: Spectral notation Ca XV
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare

Window height (pixels): 360 Default width (pixels): 72

Number of exposures/set: 3 Exposure(Delay) time s(ms): 50.00(10),0.00(0),0.00(0)

Number of exposure sets: 1 Duration (s): 50.010

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 54s **Volume:** 5265 kBits **Data rate:** 98.8668 kBits/s
Title: [RA:000001] [SNS:1set] [ss:1*] [vH:360,nWins:4,LL:000000] [ExpT(Delay):50.00(10)0.00(0)0.00(0)]

Exit

* Setting the different exposure times and their delays:

EIS Raster: Set Exposure Times

Set Exposure Times (s)

Exposure 1: Time (s): 50.00 Delay (ms): 10
Exposure 2: Time (s): 10.00 Delay (ms): 10
Exposure 3: Time (s): 5.00 Delay (ms): 10

* The new exposure times are now set:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000000
 Acronym: Example_Lines
 Created: 20-Jun-2006 J
 Author: David

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	72
2	195.12 (c)	Fe XII	1292	1	72
3	200.98 (p)	Ca XV	1555	1	96
4	256.32 (c)	He II	472	2	72

Selected Line

Pixels: 1507 : 1555 : 1602
 Wavelength: 199.91 : 200.98 : 202.03
 Width: 96 Full Range
 Name: Spectral notation Ca XV
 Text (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/stot selection: 1 Raster Type: Scanning Sit'n'Stare

Window height (pixels): 360 Default width (pixels): 72

Number of exposures/set: 3 Exposure(Delay) time s(ms): 50.00(10),10.00(10),5.00(10)

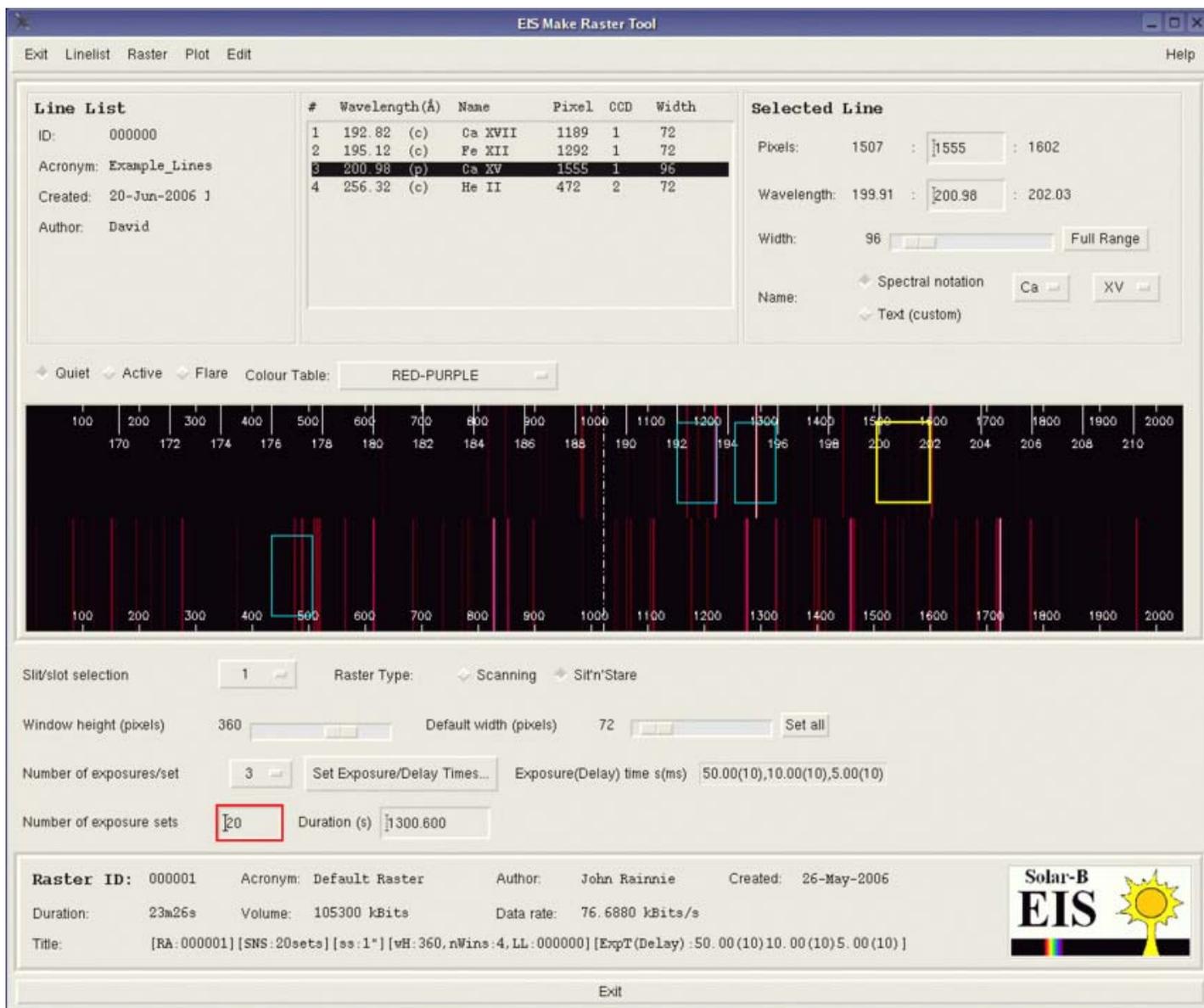
Number of exposure sets: 1 Duration (s): 65.030

Raster ID: 000001 **Acronym:** Default Raster **Author:** John Rainnie **Created:** 26-May-2006
Duration: 1m10s **Volume:** 5265 kBits **Data rate:** 76.6880 kBits/s
Title: [RA:000001][SNS:1set][ss:1*][vH:360,nWins:4,LL:000000][ExpT(Delay):50.00(10)10.00(10)5.00(10)]

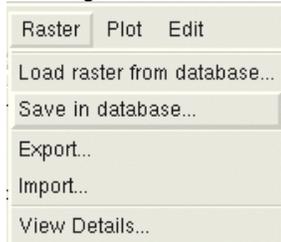
Solar-B EIS

Exit

* Change the number of sit'n'stare sets to 20:



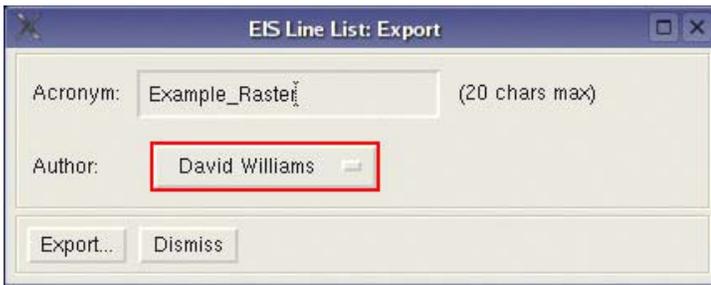
* Saving the raster to the database:



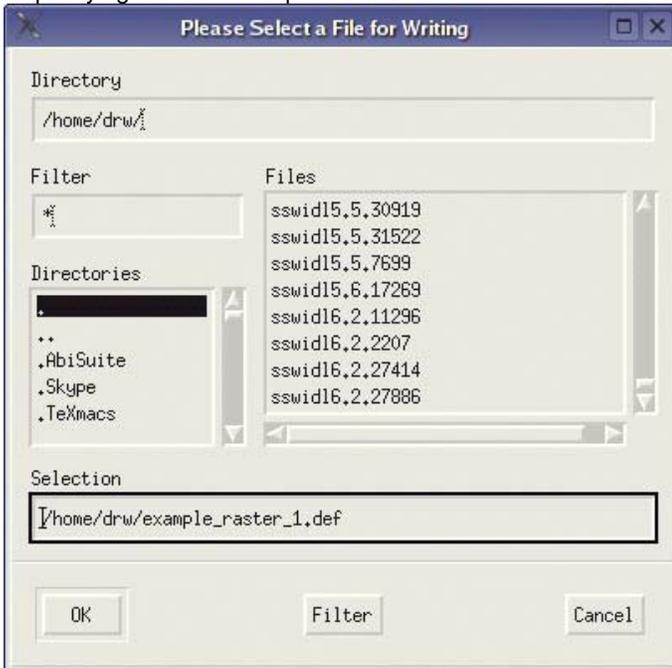
* If the corresponding linelist hasn't yet been saved to the database...:



* Exporting a raster to ASCII format:



* Specifying the raster's exported filename:



* The finished product?:

EIS Make Raster Tool

Exit Linelist Raster Plot Edit Help

Line List

ID: 000000
 Acronym: Example_Lines
 Created: 20-Jun-2006 J
 Author: David

#	Wavelength(Å)	Name	Pixel	CCD	Width
1	192.82 (c)	Ca XVII	1189	1	72
2	195.12 (c)	Fe XII	1292	1	72
3	200.98 (p)	Ca XV	1555	1	96
4	256.32 (c)	He II	472	2	72

Selected Line

Pixel: 1507 - [1555] - 1602
 Wavelength: 199.91 - [200.98] - 200.03
 Width: 96 [Full Range]
 Name: Special notation
 Test (custom)

Quiet Active Flare Colour Table: RED-PURPLE

Slit/slot selection: 1 Raster Type: Scanning Slit'n'Stare

Window height (pixels): 360 Default width (pixels): 32 [Set all]

Number of exposures/set: 3 [Set Exposure/Delay Times...] Exposure(Delay) time s(ms): 50.00(10),10.00(10),5.00(10)

Number of exposure sets: [20] Duration (s): 1300.600

Raster ID: 000000 **Acronym:** Example_Raster **Author:** David **Created:** 20-Jun-2006 16
Duration: 23m26s **Volume:** 105300 kBits **Data rate:** 76.6880 kBits/s
Title: [RA:000000] [SNS:20sets] [ss:1*] [vH:360,nWins:4,LL:000000] [ExpT(Delay):50.00(10)10.00(10)5.00(10)]

Solar-B EIS

Exit

This topic: SolarB > [EISPlanningToolGuide](#)

History: r22 - 20 Jun 2006 - 17:06:09 - [DaveWilliams](#)

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