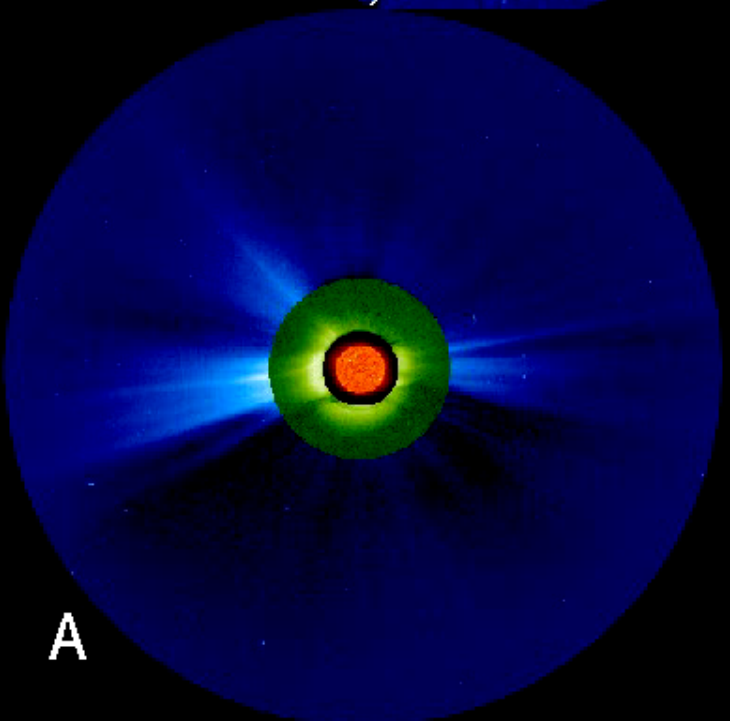


B



A



# NRL IDL Movie Tools

**SECCHI Meeting  
March 22-23 2010  
Dublin, Ireland**

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Nathan Rich (202-404-1408)**  
*NRL/Interferometrics Inc.*

# NRL IDL Movie Tools

## • Introduction

- These are IDL tools in Solarsoft written specifically for LASCO/EIT/SECCHI images
- Instructions for accessing and using SECCHI data may be found via <http://secchi.nrl.navy.mil/wiki> under Data Processing And Analysis
- Details about each of the tools in this presentation are also available through the [wiki](#) or in `$SSW/stereo/secchi/doc/secchimvi.htm`

**SECCHI Home****SECCHI Wiki Home**

1. Planning
2. Operations
3. Flight Software
4. Data Processing and Analysis
5. SECCHI-A Event Log
6. SECCHI-B Event Log
7. Meetings
8. Mailing Lists
9. Publications

**PmWiki**

WikiSandbox  
Basic Editing  
Documentation Index  
PmWiki FAQ

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[Main /](#)

## Data Processing And Analysis

**Analysis Software**

- [HOW TO Guide](#)
- [SECCHI NRL Movie Tools](#)
- [Jmap HOWTO](#)
- [SECCHI\\_PREP](#) - Tool for ingesting and calibrating SECCHI data
- [\\$SSW\\_SECCHI/idl](#) - Solar Soft IDL programs for displaying and calibrating SECCHI data
- [FESTIVAL](#) (SECCHI and EIT/LASCO FITS data display & manipulation)
- [EUVI Analysis Software \(mjastereo and sbrowser packages\)](#)
- [STEREO SPICE \(pdf\)](#) and the [WCS spec \(pdf\)](#)
- [CME Mass Tutorial](#)
- [SSC Software Portal](#) - Overview of STEREO instrument software

**Image Calibration**

- [Coronagraph ICAL Wiki](#)
- [COR2](#)
- [UKSSDC HI Wiki](#)
- [Attitude History Plots](#)
- [Sequence vs. Double Images](#)

**Image Headers**

- [SECCHI FITS Keywords Definition \(PDF\)](#)
- Coordinate systems for solar image data by W.T. Thompson ([coordinates.pdf](#))
- [FITS World Coordinate System Page](#)
- [Science Header Actuals Definitions \\*](#)
- [SECCHI Rectification Cheat Sheet \(PDF\)](#)
- Suggested [Simulated Data Headers](#) for simulation FITS images
- Suggested [Density Cube Headers](#) for density cube models and solutions
- [HI Headers and Pipeline Processing](#)

**[Guidelines for SECCHI IDL Software Developers \\*](#)**

Solar Soft, etc.

**SECCHI Data Management**

- [Data Management Plan\\_r2d2.pdf](#)
  - [Diagram \(png\)](#)
- [Description of SECCHI Data Archive](#)
- Pipeline:
  - [Level 0 timeline](#) (LZ image data)

Information about SECCHI movie tools may be found [here](#).

If you want CALIBRATED images, see the [SECCHI PREP User Guide](#).

## RETRIEVING SECCHI DATA

If you do not have the SECCHI FITS archive available to you locally, there are two ways to retrieve the data:

1. **Web query** is available at <http://secchi.nrl.navy.mil>. This method offers the most options for query search.
2. **Using Solarsoft/IDL** you may use [xsecchi\\_vso\\_ingest.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_ingest.pro) to retrieve data from the STEREO Science Center over a socket. Note that this tends to be a slow process (about 4.7MB, or 1 file, per minute).

If you do have the SECCHI FITS archive available to you locally in \$secchi or \$SECCHI\_LZ, there are two ways to retrieve lists of FITS files:

1. The fastest way to query for large intervals of SECCHI data is using the summary files and [scc\\_read\\_summary.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_read_summary.pro) which returns an array of structures with the summary file information. After retrieving this information, you may use [sccfindfits.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_findfits.pro) to retrieve path information for each file.
2. If you are doing a more targeted search and/or want to refine your search using more parameters, there is [sccclister.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_clister.pro). This returns a structure of filenames (including path) for Ahead and/or Behind. (Note: For date ranges more than a few days, as implemented, this takes a long time.)
3. Finally, it is possible to do an image database query from IDL using [sqdb.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_db.pro). (Note: This method only works at NRL.)

## SECCHI PRETTY PICTURES ONLINE

Go to <http://secchi.nrl.navy.mil/images> and browse the categories that appear in the left-hand sidebar.

## SECCHI PRETTY PICTURE MAKING

[Scc\\_mk\\_image.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_mk_image.pro) will turn (almost) any SECCHI FITS file into a pretty picture using default settings. To use this routine, you just supply it with a SECCHI FITS file name, and it will return to you a beautiful, byte-scaled, "pretty" data array. Example (incl. comet!):

```
IDL> purdy_image=scc_mk_image('$secchi/lz/L0/a/img/cor2/20070608/20070608_013730_d4c2A.fits')
IDL> tv,purdy_image
```

You can choose the output size (default is 1024), turn logo/date-time stamp off, or control size of stamp. See the pro header for other options.

### Using [SECCHI PREP](#) for pretty pictures

To return 512x512 images corrected only for exposure duration and Binning, and data values in header not updated (quicker):

```
IDL> SECCHI_PREP, filenames, headers, images, OUTSIZE=512, /NOCALFAC, /CALIMG_OFF, /UPDATE_HDR_OFF, /EXPTIME_OFF
```

## SECCHI BACKGROUND IMAGES

Retrieve background images for a SECCHI image with [scc\\_getbkgimg.pro](http://sohowwww.nascom.nasa.gov/solarsoft/stereo/secchi/doc/scc_getbkgimg.pro):

```
IDL> bkg = scc_getbkgimg(secchi_fits_hdr)
```

Options: /SILENT = Don't print out informational messages

Done

Observation Range: 2000-10-27 00:23:00 - 2010-03-03 23:59:57

Please enter qualifiers in the fields below (**Date Obs** is required) and press the **Search** button.

For simple queries use our [short query form](#).

Start Date Obs: 10 27 2006 00 00 00 MM/DD/YYYY hh:mm:ss

End Date Obs: 10 27 2006 23 59 59 MM/DD/YYYY hh:mm:ss

Image Cadence: All (Cadences are anchored to the Start Date Obs)

**Detector**  Wavelength/Polarizer  Filter

- EUVI All All
- COR1 All
- COR2 All
- HI-1
- HI-2
- All

Filename.....

Observatory... A&B

A&B Synched... All

SEB Program... All

Set ID.....

BiasMean..... UnderScan Method

Exptime..... sec

LED Color... All

CCD-X Binning:

CCD-Y Binning:

Naxis1..... Note: hdr\_only images, naxis=0, and HI high-byte image files, naxis>0, can not be downloaded

Naxis2..... and are marked with diskpath="None". To query for them choose diskpath="for hdr-only".

Door Stat... All

Data Level... Level-0.5

DownLink... SSR1

IP Steps... All (ipsteps 0-119) non-default selections result in slower queries

Diskpath... for downloadable images

Date Mod... Not indexed (searching by Date Mod makes for slow queries)

[Extra columns on tabular output](#) :

Date Obs  
Synced Filename  
FileOrig

Use "Ctrl + left-mouse-button" to select non-consecutive columns

## SECCHI Flight (S/C A and B) Images Query Form

As of **2010-03-16 02:18:08 EST**, database contains **9656234** shutter flips and **4543135** downloadable images (excluding SWx).

**Observation Range: 2006-10-27 08:25:06 - 2010-03-12 23:58:00**

Please enter qualifiers in the fields below (**Date Obs** is required) and press the **Search** button.

For more detailed queries use our [long query form](#).

Start Date Obs:

End Date Obs:

Image Cadence:  (Cadences are anchored to the Start Date Obs)

**Detector**  Wavelength/Polarizer  Filter

EUVI

COR1

COR2

HI-1

HI-2

All

Observatory:

Data Level.:

Downlink...:

Use full-page output even if more than one row is returned (not downloadable).

Return a maximum of  records from this query.

Send comments to [dbmaster@louis14.nrl.navy.mil](mailto:dbmaster@louis14.nrl.navy.mil)

wdbi 1.5.1\_03

# SECCHI Images Query Result

Download ->

| More                 | JPG                 | Filename   | Date Obs            | Observatory | Detector |
|----------------------|---------------------|--|---------------------|-------------|----------|
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000800_d4c2A.fts</a> | 2009-10-27 00:08:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000815_n4c2A.fts</a> | 2009-10-27 00:08:15 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000845_n4c2A.fts</a> | 2009-10-27 00:08:45 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000800_d4c2B.fts</a> | 2009-10-27 00:08:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000815_n4c2B.fts</a> | 2009-10-27 00:09:04 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000915_n4c2A.fts</a> | 2009-10-27 00:09:15 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000845_n4c2B.fts</a> | 2009-10-27 00:09:34 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_000915_n4c2B.fts</a> | 2009-10-27 00:10:04 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_002400_d4c2A.fts</a> | 2009-10-27 00:24:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_002400_d4c2B.fts</a> | 2009-10-27 00:24:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_003900_d4c2A.fts</a> | 2009-10-27 00:39:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_003900_d4c2B.fts</a> | 2009-10-27 00:39:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_005400_d4c2A.fts</a> | 2009-10-27 00:54:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_005400_d4c2B.fts</a> | 2009-10-27 00:54:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010800_d4c2A.fts</a> | 2009-10-27 01:08:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010815_n4c2A.fts</a> | 2009-10-27 01:08:15 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010845_n4c2A.fts</a> | 2009-10-27 01:08:45 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010800_d4c2B.fts</a> | 2009-10-27 01:08:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010815_n4c2B.fts</a> | 2009-10-27 01:09:04 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010915_n4c2A.fts</a> | 2009-10-27 01:09:15 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010845_n4c2B.fts</a> | 2009-10-27 01:09:34 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_010915_n4c2B.fts</a> | 2009-10-27 01:10:04 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_012400_d4c2A.fts</a> | 2009-10-27 01:24:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_012400_d4c2B.fts</a> | 2009-10-27 01:24:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_013900_d4c2A.fts</a> | 2009-10-27 01:39:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_013900_d4c2B.fts</a> | 2009-10-27 01:39:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_015400_d4c2A.fts</a> | 2009-10-27 01:54:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_015400_d4c2B.fts</a> | 2009-10-27 01:54:49 | SC-B        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_020800_d4c2A.fts</a> | 2009-10-27 02:08:00 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_020815_n4c2A.fts</a> | 2009-10-27 02:08:15 | SC-A        | COR2     |
| <a href="#">MORE</a> | <a href="#">jpg</a> | <input type="checkbox"/> <a href="#">20091027_020845_n4c2A.fts</a> | 2009-10-27 02:08:45 | SC-A        | COR2     |



## STEREO/SECCHI NRL Movie Tools

\$Revision: 1.15 \$, \$Date: 2010/02/02 22:19:47 \$

Contact [mvi](mailto:mvi@cronus.nrl.navy.mil) at [cronus.nrl.navy.mil](mailto:mvi@cronus.nrl.navy.mil)

### Contents

[Web Movie Tools/Products](#): View SECCHI movies via the SECCHI website

[JPL Web Movie Tools](#): JPL's Solar Muse website

[SCC\\_PLAYMOVIE](#): Run MVI files with numerous options

[ANNOTATE\\_IMAGE](#): Add text or arrows to image or MVI frames

[WSCC\\_MKMOVIE](#): Generate MVI or standard format frames using SECCHI\_PREP

[MK\\_EUVI\\_MOVIE](#): Shortcut for making EUVI movies

[SCC\\_PLAYMOVIE\\_M](#): SCC\_PLAYMOVIE plus cursor coordinate display and height-time plotting

[SXPLOTT\\_HT](#): Display height-time data from SCC\_PLAYMOVIE\_M

[WSCC\\_COMBINE\\_MVI](#): Combine MVIS for any combination of SECCHI telescopes

[GENERIC\\_MOVIE](#): Generate MVI from data cube or standard format image files

[MVI2CARRMAP](#): Generate Carrington maps from MVI frames

[SREM\\_MOVIE](#): Create HI movies using cross-correlation to remove stellar background

[SCC\\_PNGPLAY](#) (NRL only): Quickest way to view desired movie

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### Web Movie Tools/Products

The following use already-created browse images for NRL Level-0 data (48-84 hours delay)

- EUVI-171,195,284,304A images are log-scaled
- COR2 TBr and HI images are ratios with monthly\_min background

Javascript movie tool: [http://secchi.nrl.navy.mil/index.php?p=js\\_secchi](http://secchi.nrl.navy.mil/index.php?p=js_secchi)

# SCCLISTER

IDL> files=SCCLISTER()

SECCHI Image Selection Tool v.3.0

Help PointAndClickFiles

Loading Methods:  
 Load from Catalog(s)

Select STEREO SpaceCraft: STEREO A

Select Data Level: Level-05

Instrument(s):  EUVI  COR1  COR2  HI\_1  HI\_2

Select Data Source: lz (Images from level-0 packets)

Select Data Type: Intensity

Select Observation Date:  
 From : 03 06 2010 Same end date  
 To : 03 06 2010 Same begin date

Restrict File Selection (? = all possible values for 1 char)  
 Edit as needed and Enter:  
 ???????\_??[03]5??\_???.fts

Submit

Found total of 48 SC/A files.

| FileName                  | DateObs             | Tel  | Exptme | Xsize | Ysize | Filter | Polar | Prog | OSnum | Dest | FPS | LED  | Cmpr  |
|---------------------------|---------------------|------|--------|-------|-------|--------|-------|------|-------|------|-----|------|-------|
| 20100306_000530_n4euA.fts | 2010/03/06 00:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_003530_n4euA.fts | 2010/03/06 00:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_010530_n4euA.fts | 2010/03/06 01:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_013530_n4euA.fts | 2010/03/06 01:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_020530_n4euA.fts | 2010/03/06 02:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_023530_n4euA.fts | 2010/03/06 02:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_030530_n4euA.fts | 2010/03/06 03:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_033530_n4euA.fts | 2010/03/06 03:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_040530_n4euA.fts | 2010/03/06 04:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_043530_n4euA.fts | 2010/03/06 04:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_050530_n4euA.fts | 2010/03/06 05:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_053530_n4euA.fts | 2010/03/06 05:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_060530_n4euA.fts | 2010/03/06 06:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_063530_n4euA.fts | 2010/03/06 06:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_070530_n4euA.fts | 2010/03/06 07:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_073530_n4euA.fts | 2010/03/06 07:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_080530_n4euA.fts | 2010/03/06 08:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_083530_n4euA.fts | 2010/03/06 08:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_090530_n4euA.fts | 2010/03/06 09:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_093530_n4euA.fts | 2010/03/06 09:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_100530_n4euA.fts | 2010/03/06 10:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_103530_n4euA.fts | 2010/03/06 10:35:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |
| 20100306_110530_n4euA.fts | 2010/03/06 11:05:30 | EUVI | 8,01   | 2048  | 2048  | S1     | 195   | Norm | 1644  | SSR1 | ON  | None | ICERS |

Sub-Select Options

Tel: All ExpBeg: ExpEnd: Xsize: Ysize: Filter: All Polar: 195 SebProg: All OSnum: Dest: SSR1 Compression: All

Query ReloadOrig

Sort Display by: Ascending DateObs Sort

Save Displayed Image File Names and Info as: scc\_images.sav consisting of images.fnames and images.info Save

Done - Return Filenames



# WSCC\_MKMOVIE

IDL> wssc\_mkmovie, files.sc\_a or IDL> wssc\_mkimage ,one\_file

WSSC\_MKMOVIE

pB Series Options:  
None

Image Scaling  
BYTSCL Min: -2.00 Max: 2.00  
 Automatic scaling  
Unsharp/Smooth Box: 0  
 Use SECCHI\_PREP color table  
Fill Color (1-256): -1  
(-1 for median)  
Sharpen Ratio Factor: 0.0150  
 Do Median  
Use LOG Scaling

Type of Movie  
 Straight  
 Difference  
 Running Diff  
 Unsharp  
 Ratio  
 Sharpen Ratio  
Running diff of: 1  
For Base Frame Use: Monthly Min  
 New bkg each frame  
Use every 1 file from input.  
 Average skipped frames  
FFV size: 512x512

Options  
 Display Date  
 Normalize to exptime  
 Sort by Date  
 Flat field/vignet  
 Physical units  
 Rotate North Up  
 Use SECCHI Logo  
 Show Limb  
 Mask Outer Field  
 Add Objects (HI2)  
S/C Options:  
Both, B on Left  
All (fill w/prev)  
Date size: 1  
Do Not Mask Occulter  
Do Not Fill Data Gaps

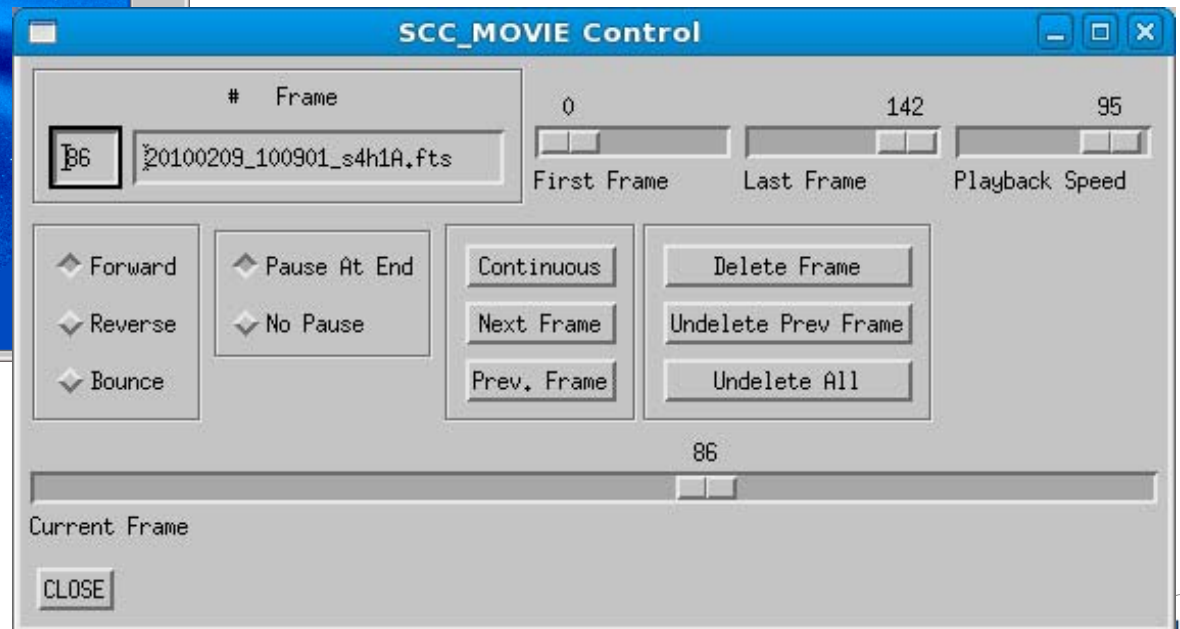
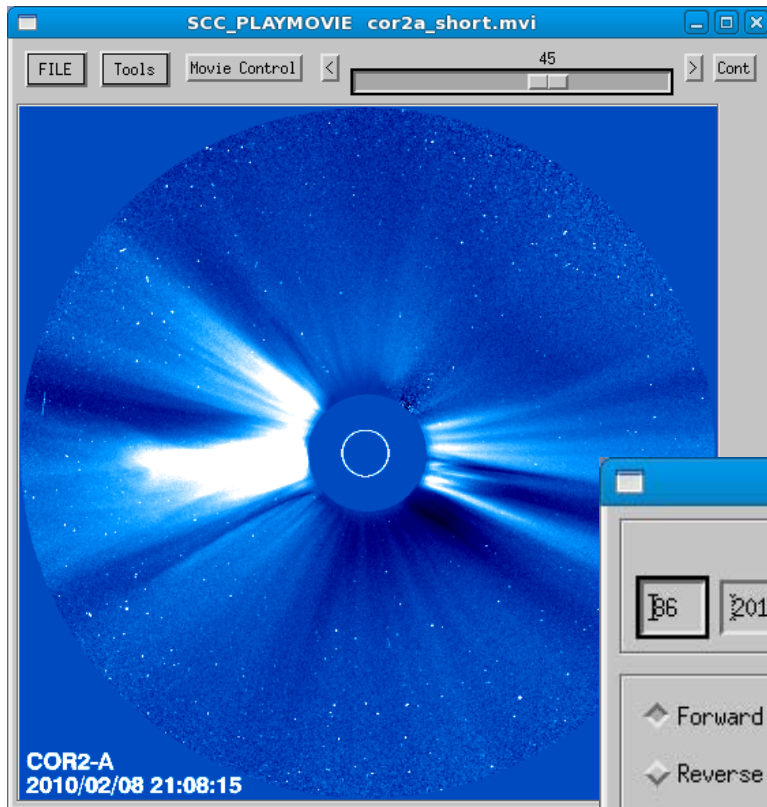
Subfield Coordinates  
 Use interactive subfield  
 Clear Subfield  
Relative to 2048x2048 image  
X1: 0 X2: 2047  
Y1: 0 Y2: 2047  
Use Integer Factors  
(Ex: Y1=512 Y2=1535)  
 Use Box Normalization  
Relative to 2048x2048 image  
X1: 973 X2: 1072  
Y1: 1948 Y2: 2047

None  
Total Brightness  
Polarized Brightness  
Polarization Angle  
Percent Polarized

CREATE MOVIE TEST MOVIE XLOADCT CLEAR TEXT CANCEL

# SCC\_PLAYMOVIE

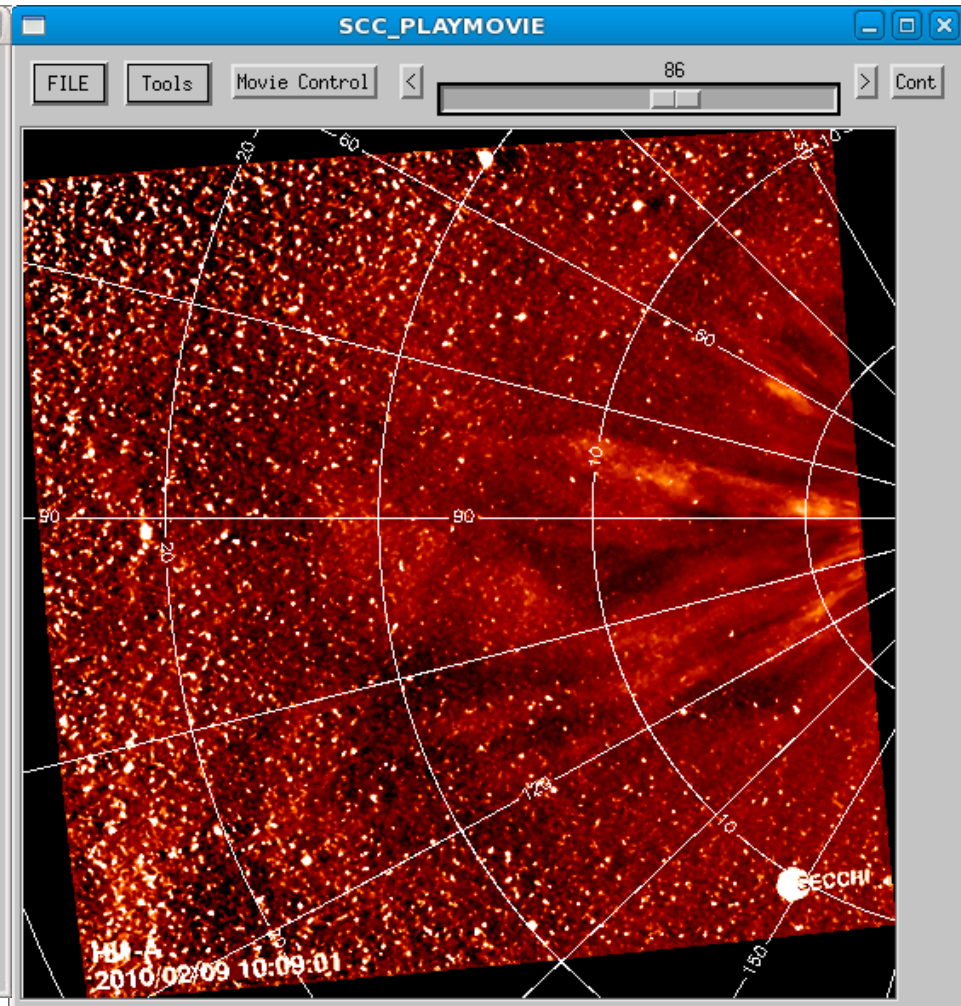
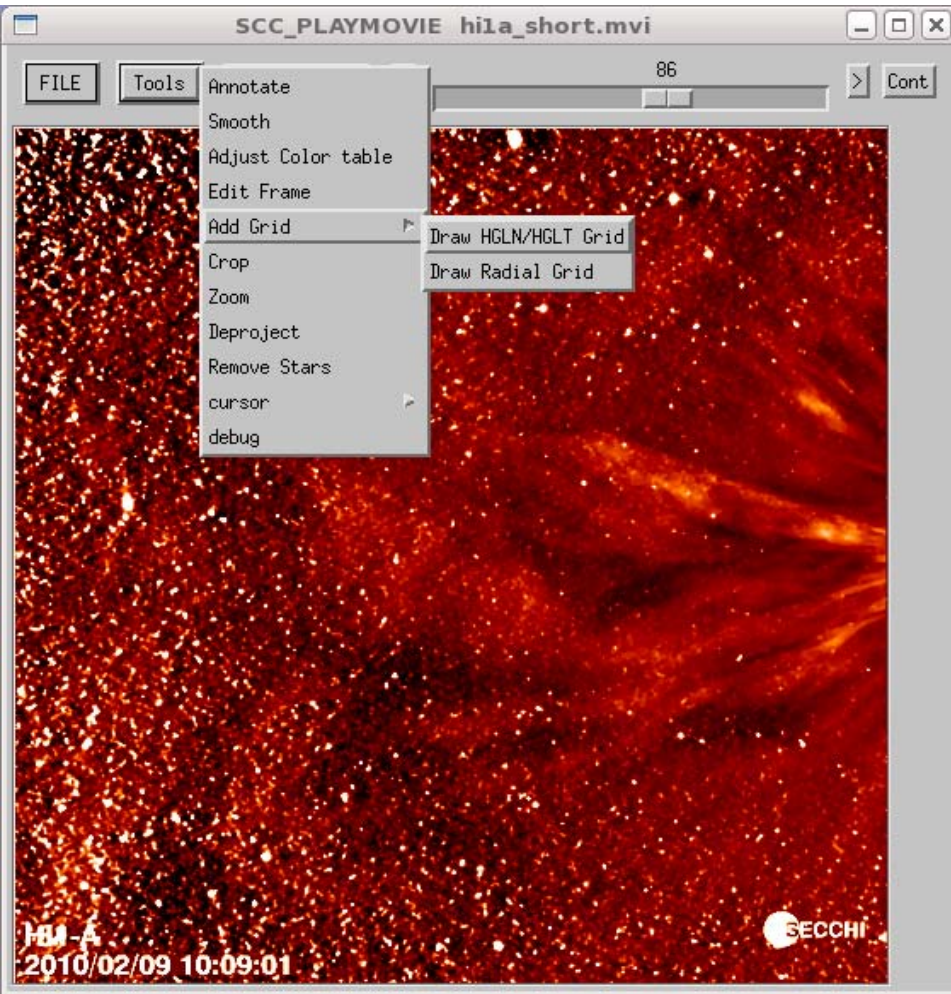
IDL> scc\_playmovie ,[ 'cor2a\_short.mvi']



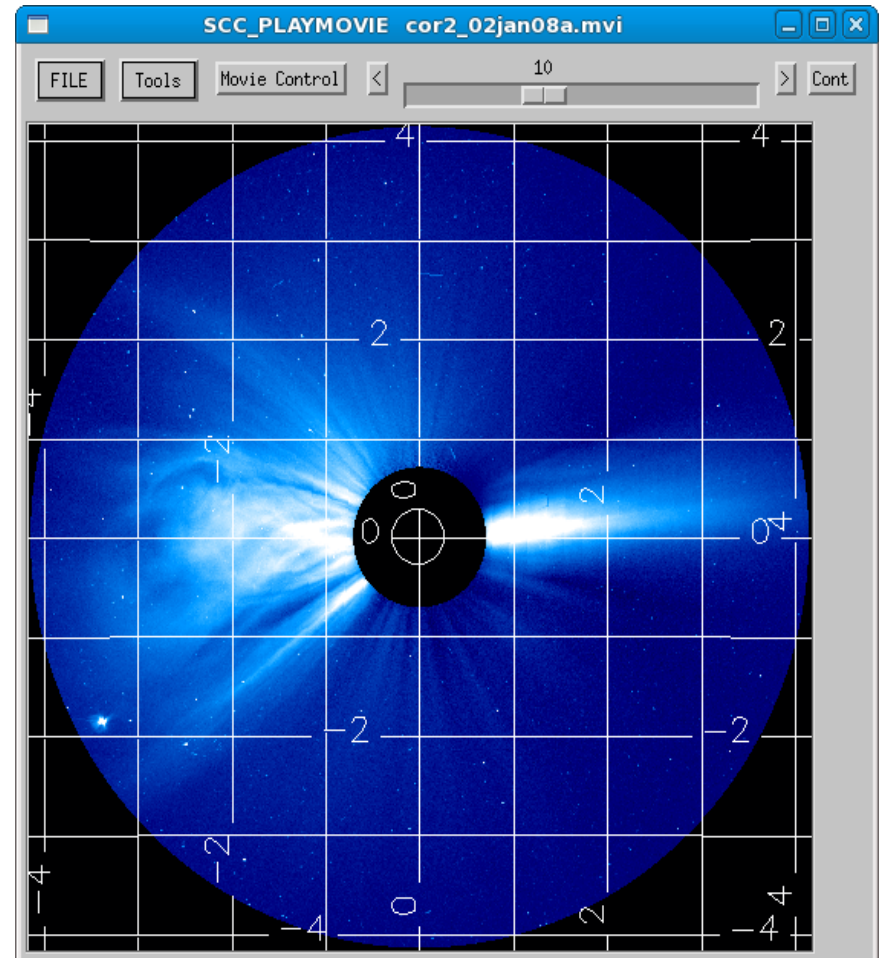
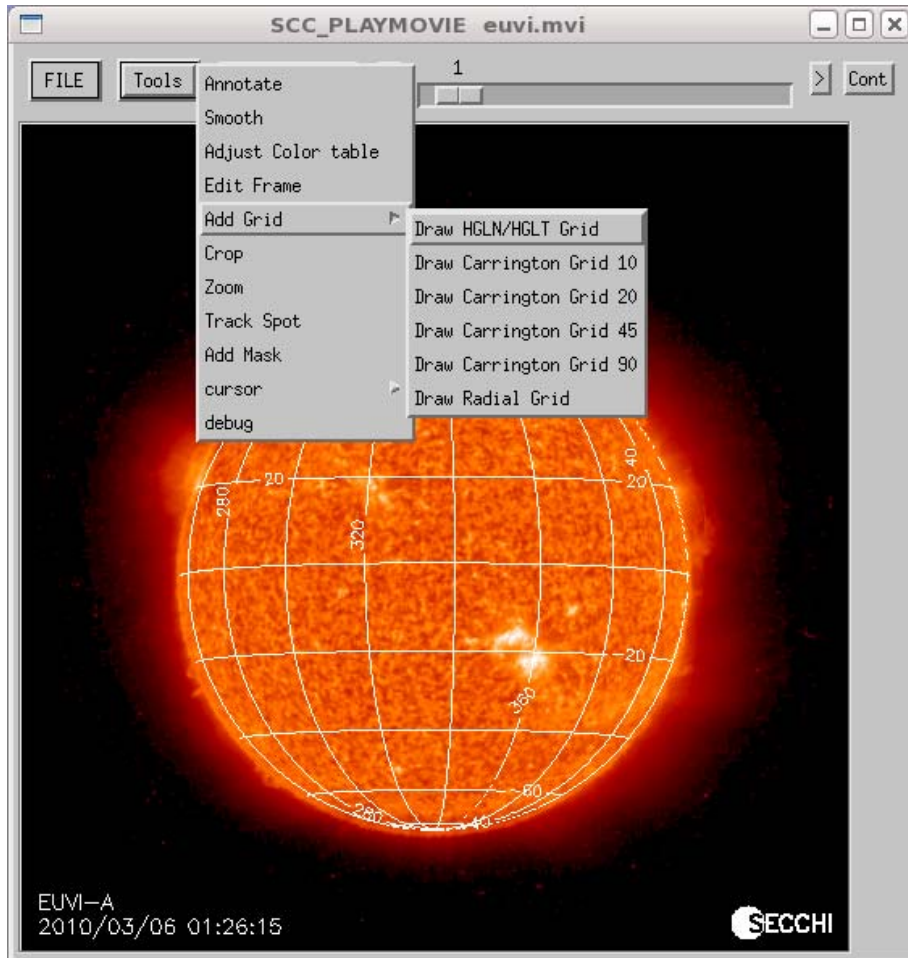
# SCC\_PLAYMOVIE: HI2

The image displays two instances of the SCC\_PLAYMOVIE software interface. The left window, titled "hi2a\_test.mvi", shows a blue-tinted solar image with a "Tools" menu open, highlighting "Annotate". A "SELECT MASK" dialog box is overlaid, containing fields for "X Center" (256), "Y Center" (256), "Outer Mask size" (260), and "Color" (0). The right window, titled "hi2a\_2.mvi", shows a similar solar image with a vertical line and labels "Earth SOHO" and "\*B". A "SELECT OBJECTS" dialog box is overlaid, containing fields for "SECCHI-B" (\*1nB), "EARTH" (\*1aEarth), "SOHO" (\*1bSOHO), "Size" (2.0), and "Color" (255).

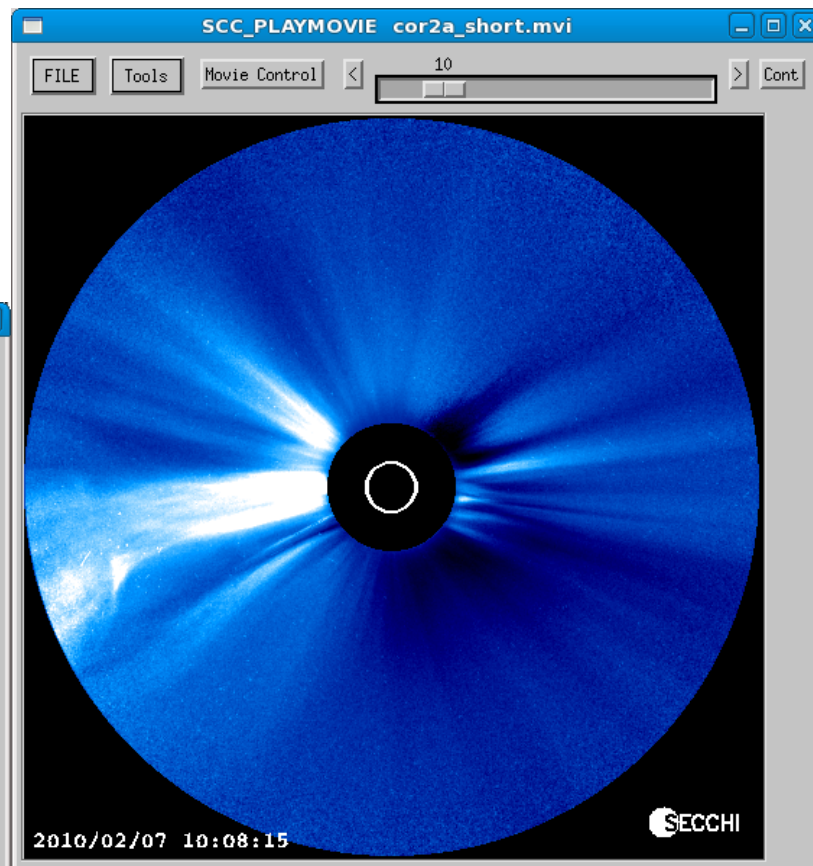
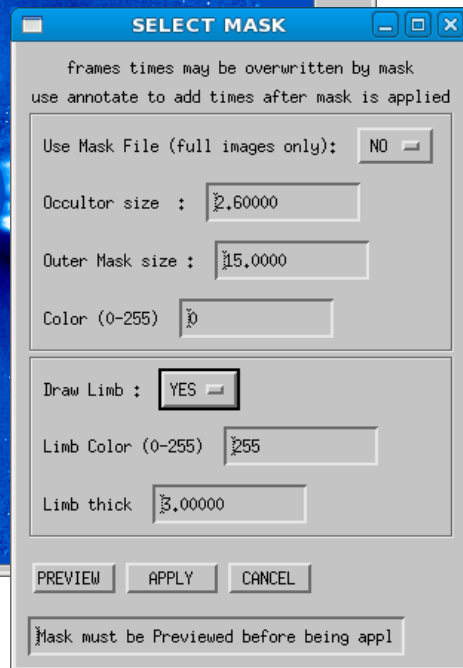
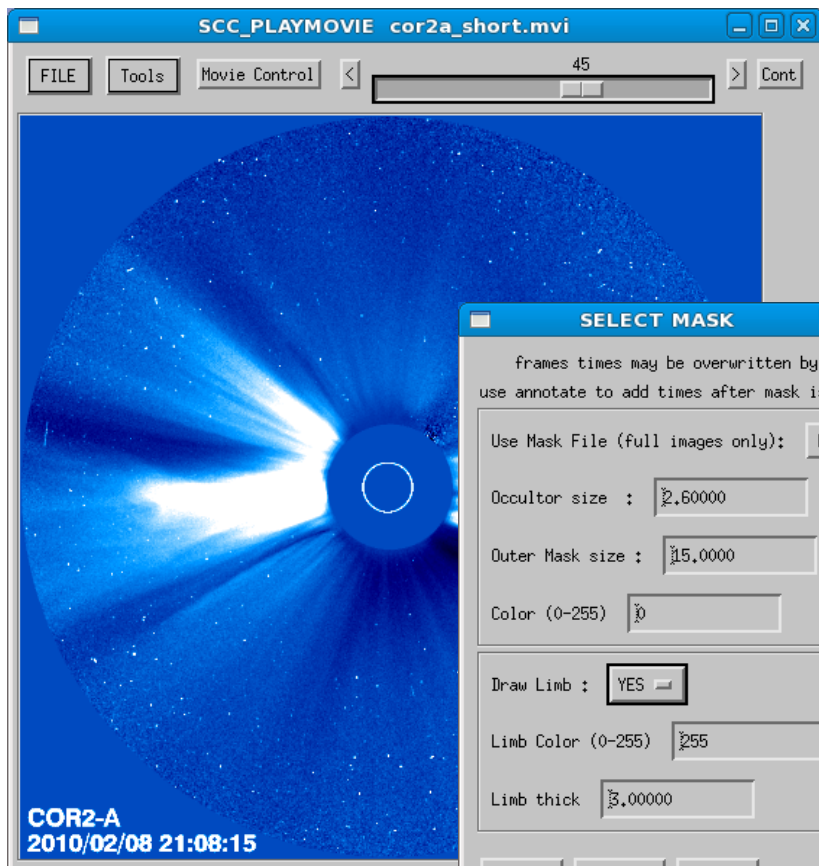
# SCC\_PLAYMOVIE: HI1



# SCC\_PLAYMOVIE Grids

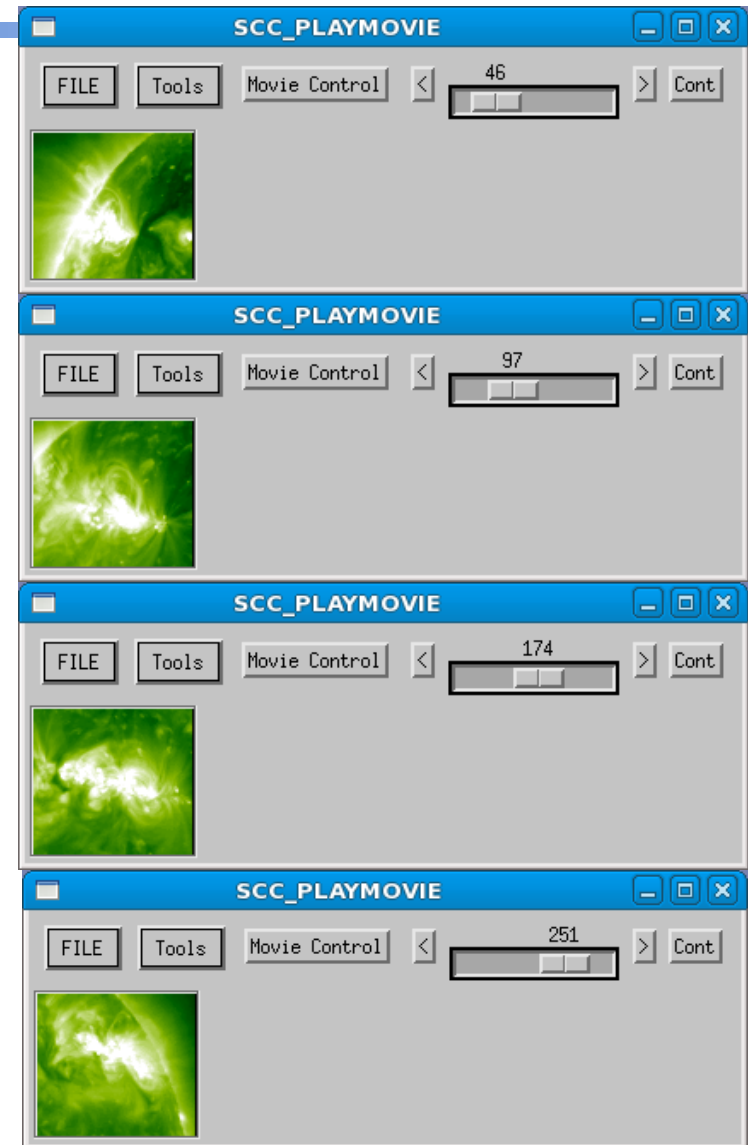
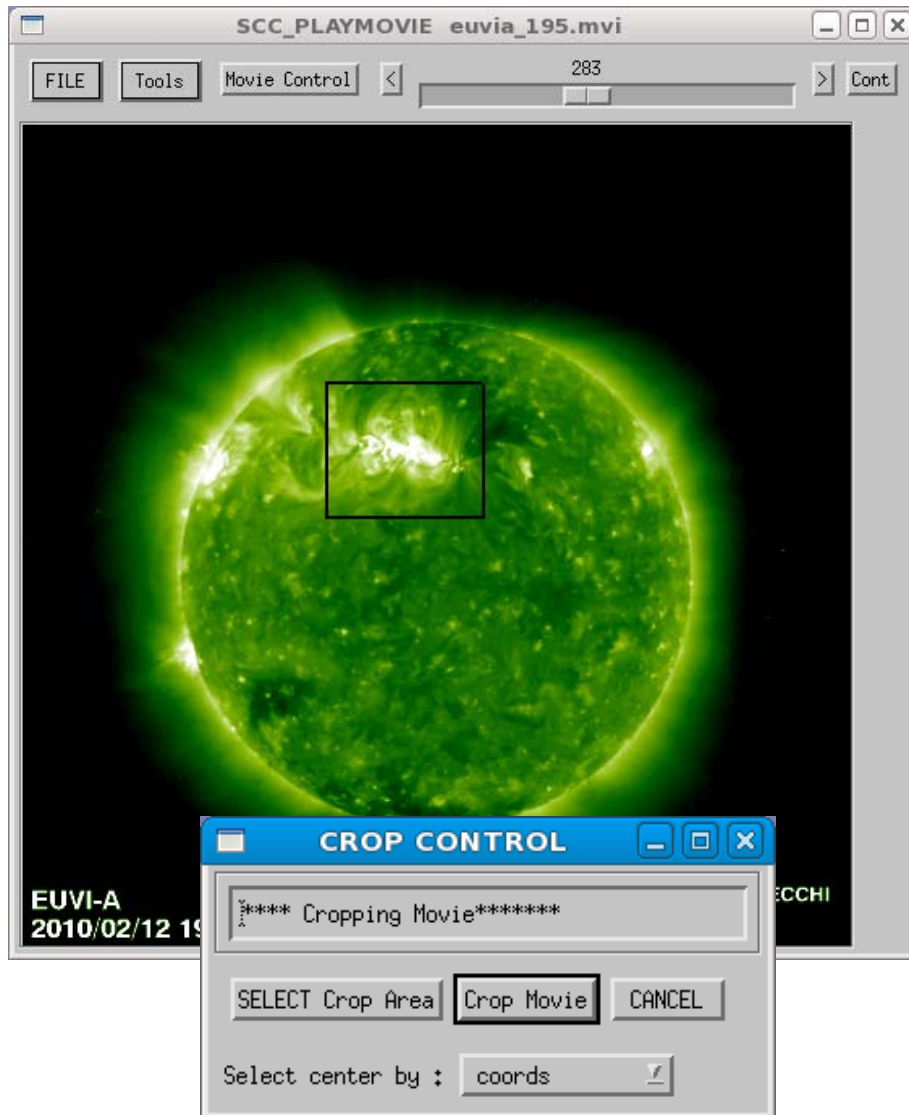


# SCC\_PLAYMOVIE: COR2 Mask

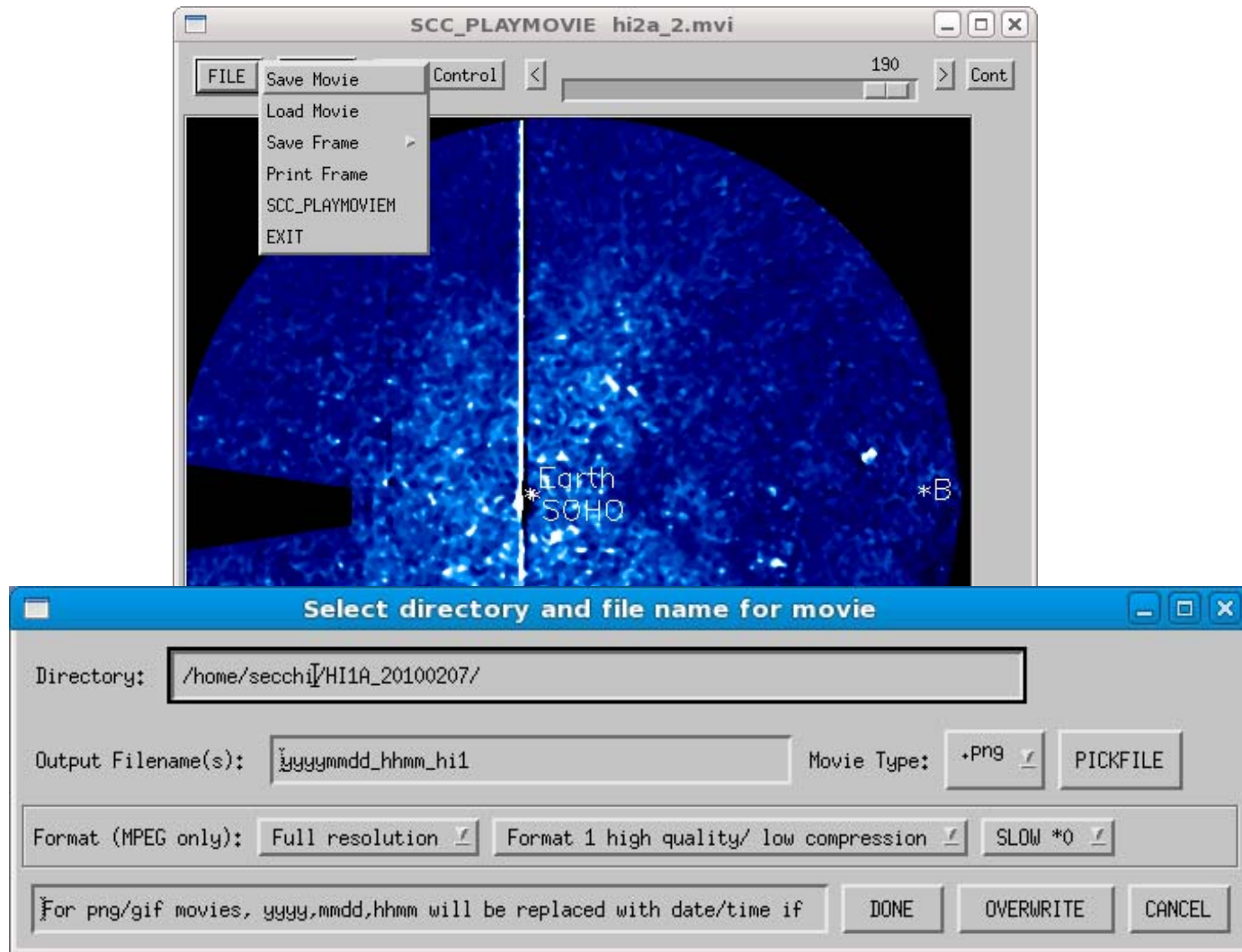




# SCC\_PLAYMOVIE: EUVI CROP



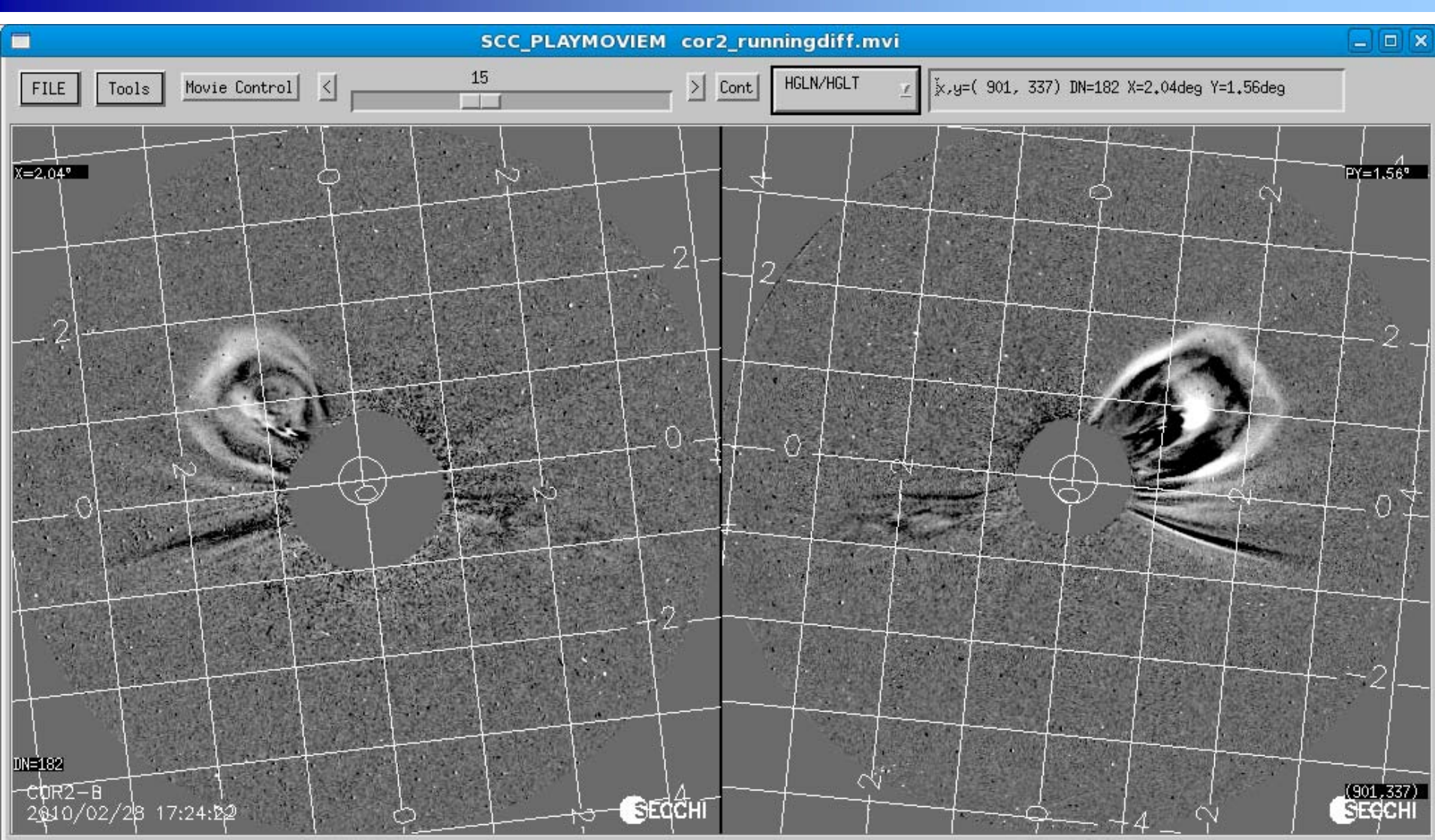
# SCC\_PLAYMOVIE: Save



# SCC\_PLAYMOVIEM

- **Display cursor position in Heliocentric Radial, Heliocentric Cartesian, or Carrington coordinates**
  - Coordinates are corrected for distortion and spherical projection (a factor for HI and COR2)
- **Track subfield by Carrington coordinate**
- **Generate “Height-Time” plots using manual pixel/feature selection**
- **Synchronize time and position with Jmaps via TOOL2A.PRO (and vice versa)**

# SCC\_PLAYMOVIEM: AB movies



# SCC\_PLAYMOVIEM: EUVI Track Spot

SCC\_PLAYMOVIEM euvi\_171a.mvi

FILE Tools Movie Control 81

Carrington  $x,y=(511, 194)$  DN= 0 E=0.4566deg PA=266.87deg

E=0.4566° PA=266

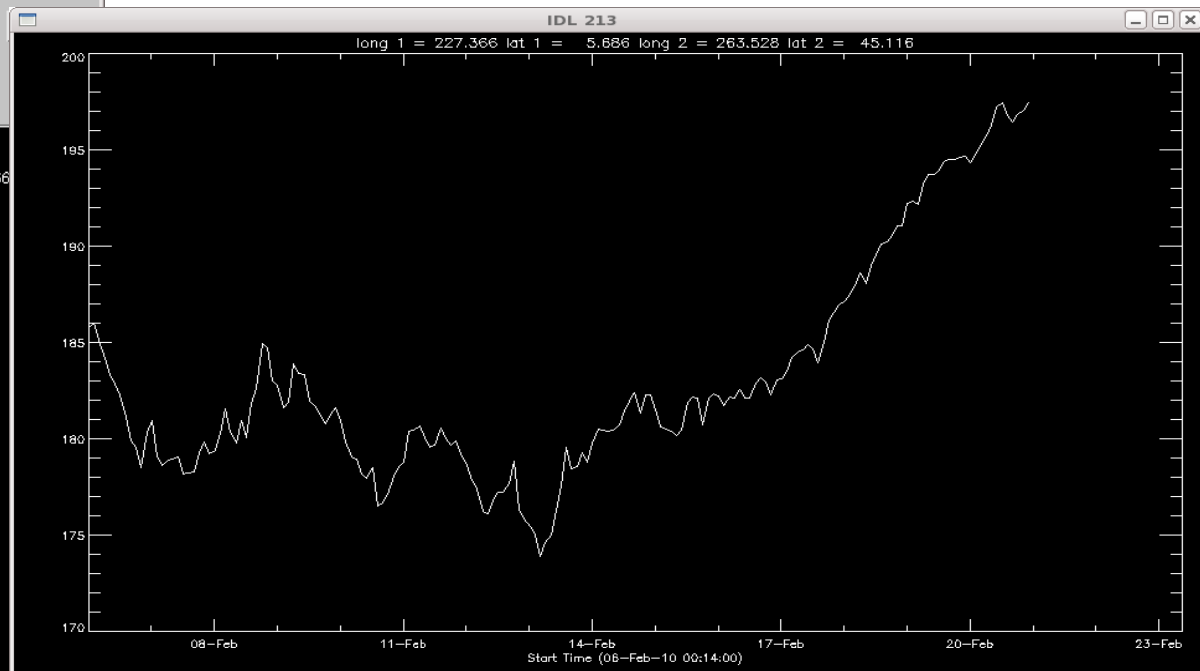
DN=0  
EUVI-A  
2010/02/12 18:14:00

SPOT TRACKING CONTROL

Press select to redo or cancel to exit

Track Spot by : coords  SELECT Spot Area Track Spot CANCEL

Output Filename: euvi\_171a PICKFILE



long 1 = 227.366 lat 1 = 5.686 long 2 = 263.528 lat 2 = 45.116

OBSRVTRY STEREO\_A

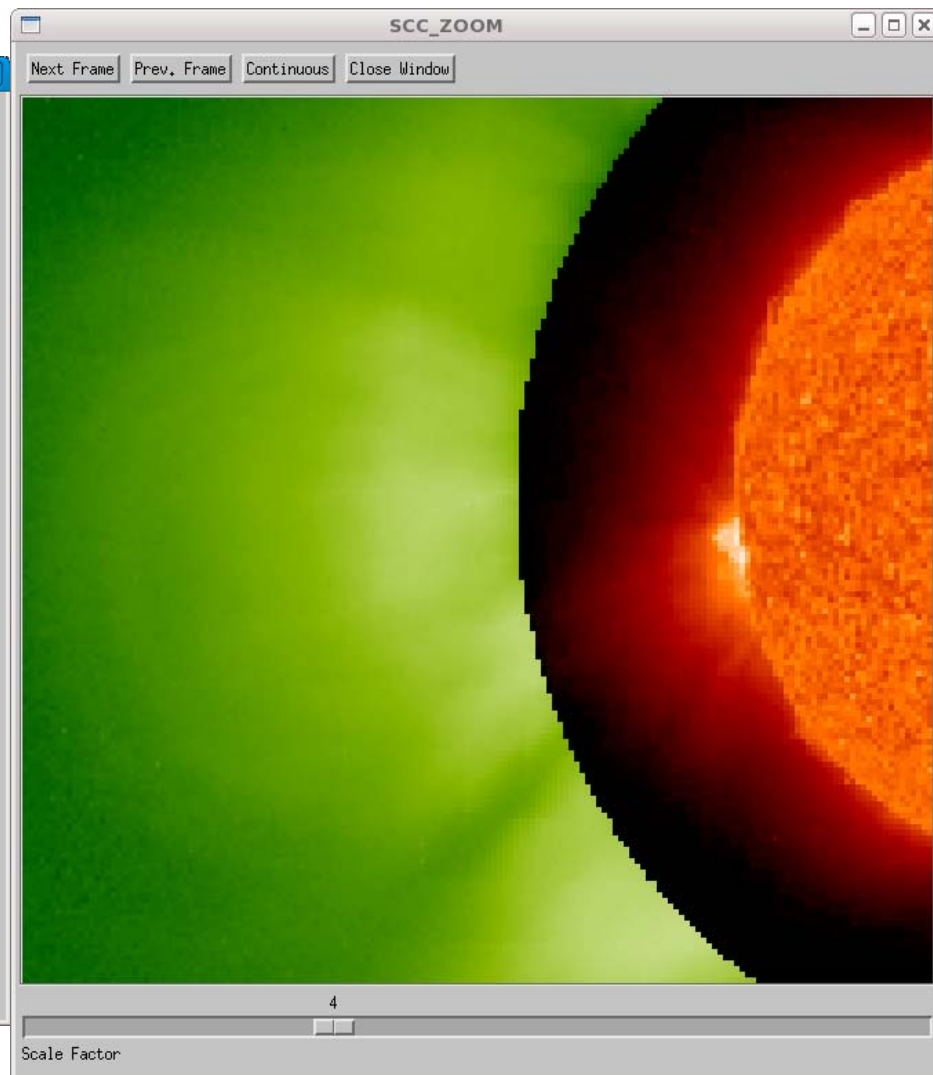
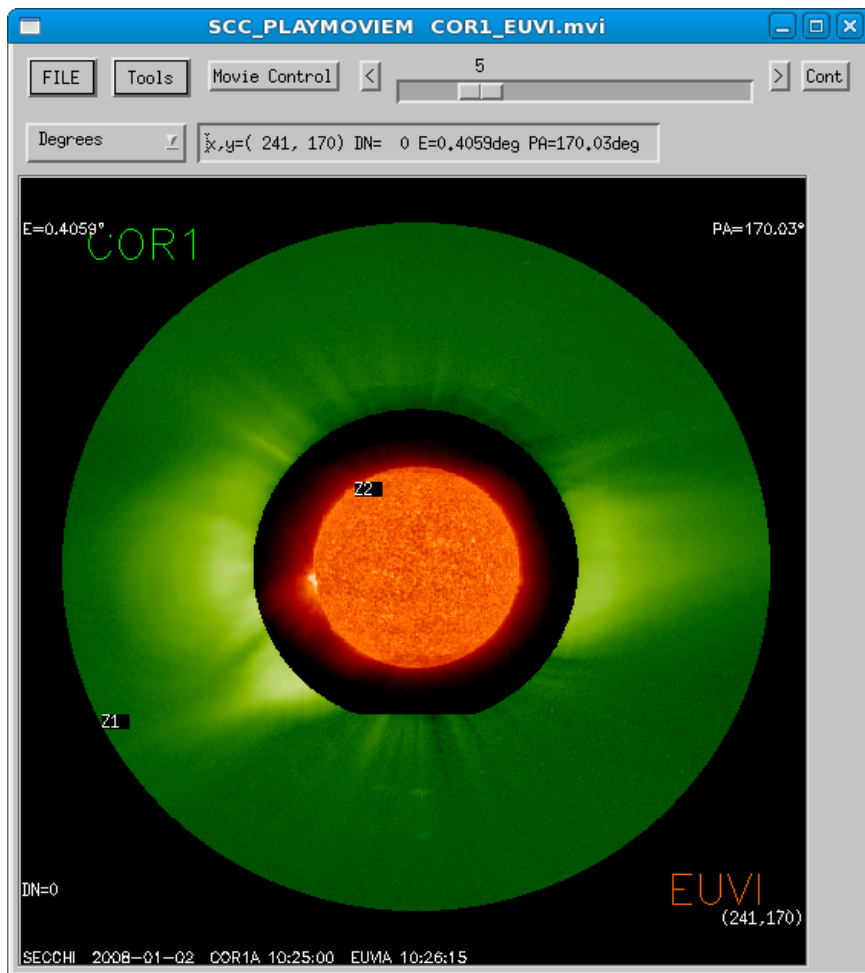
DETECTOR EUVI

FILTER S1

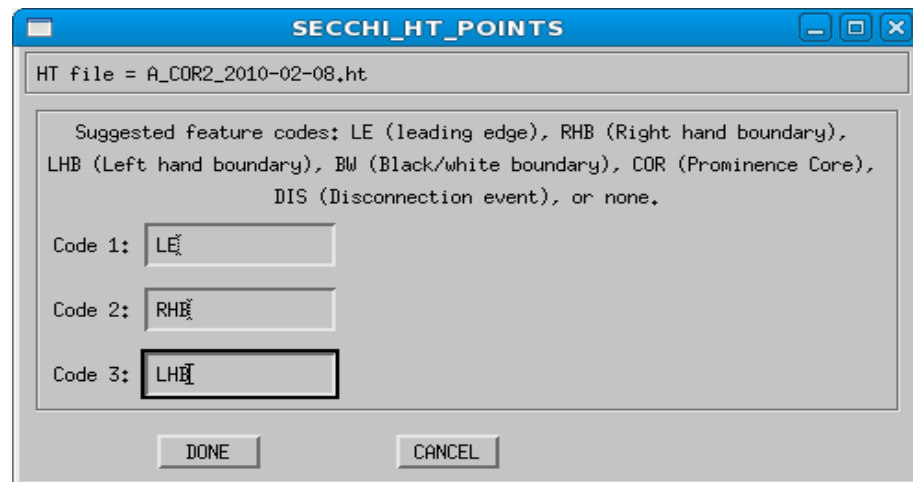
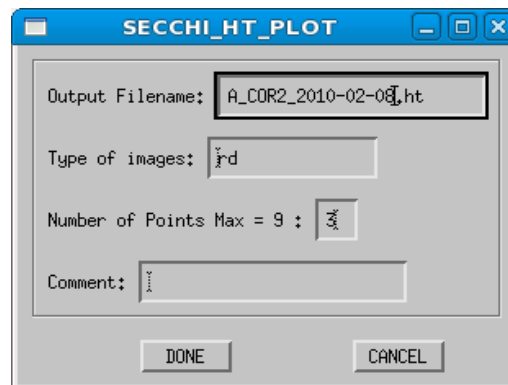
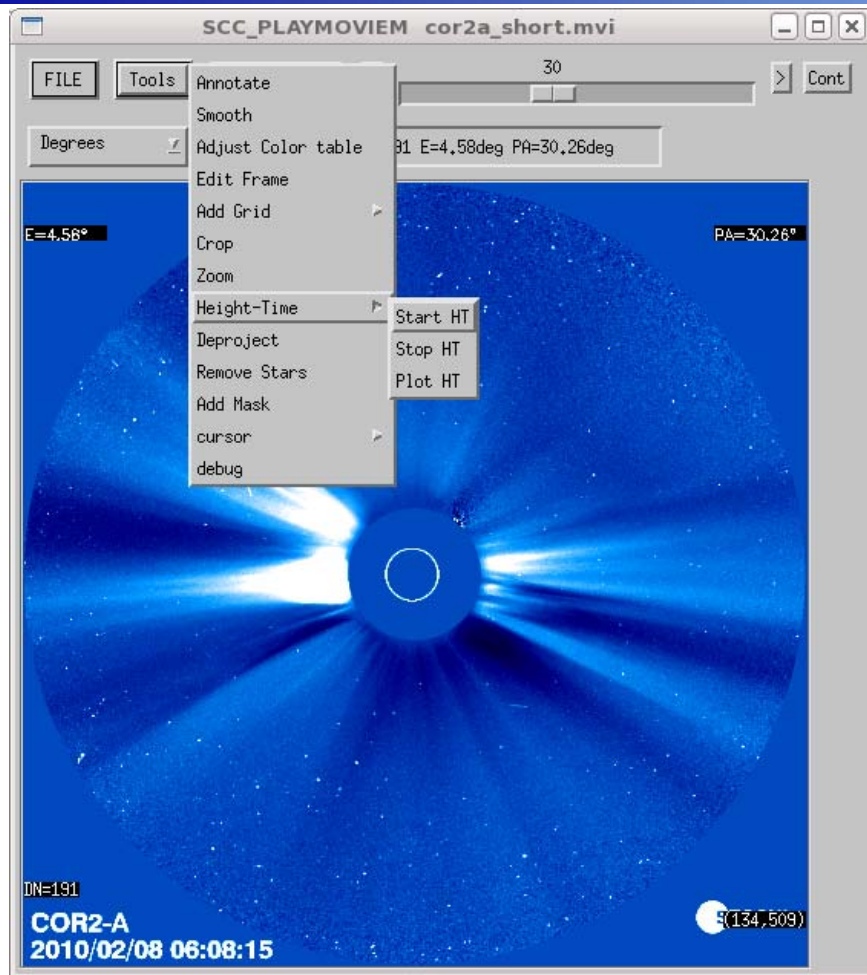
WAVELNTH 171

| DATE/TIME               | Total   | N_pixels | Average |
|-------------------------|---------|----------|---------|
| 2010-02-06T00:14:00.007 | 16534.0 | 89       | 185.775 |
| 2010-02-06T02:14:00.008 | 22692.0 | 122      | 186.000 |

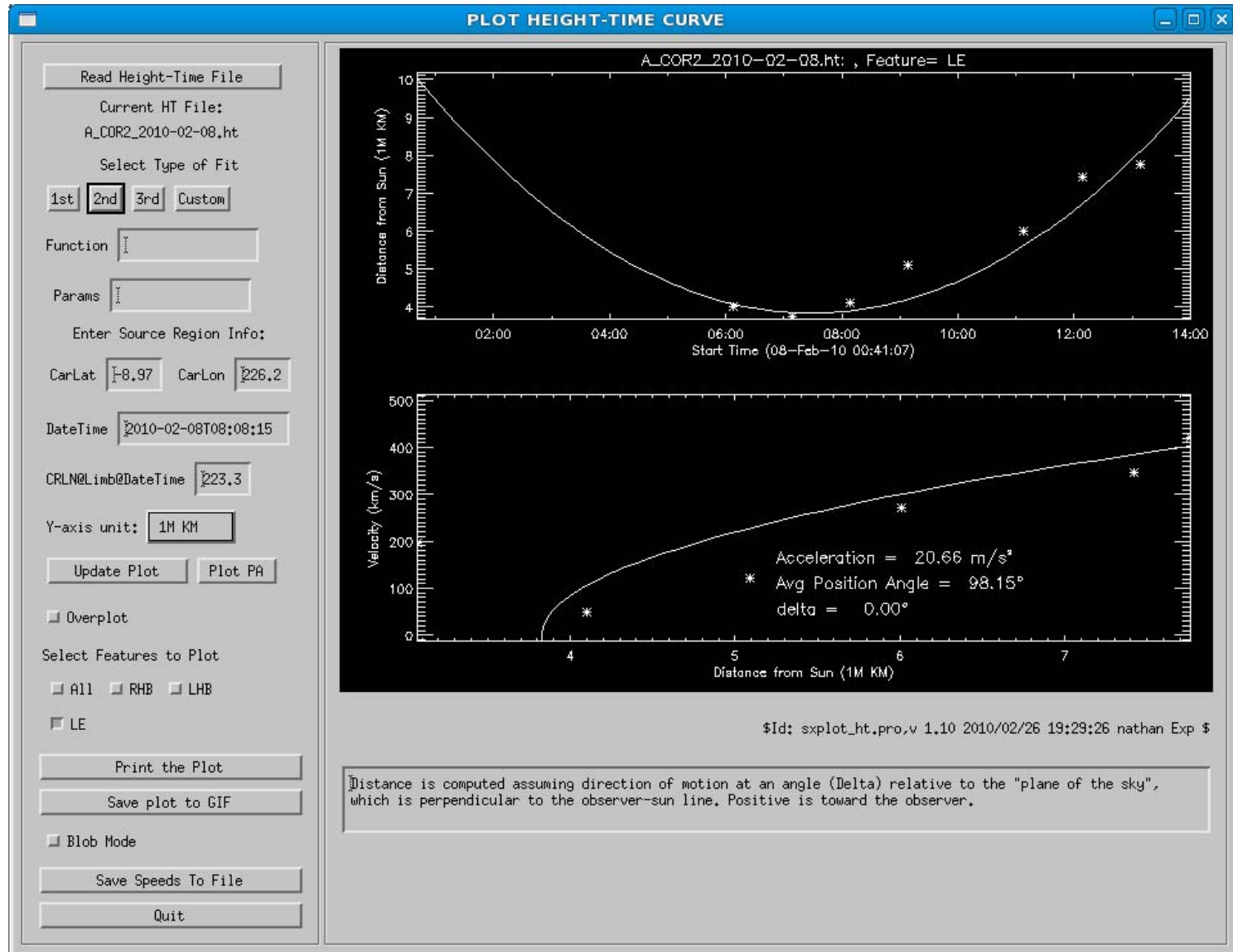
# SCC\_PLAYMOVIEM: ZOOM



# SCC\_PLAYMOVIEM: HT Plot

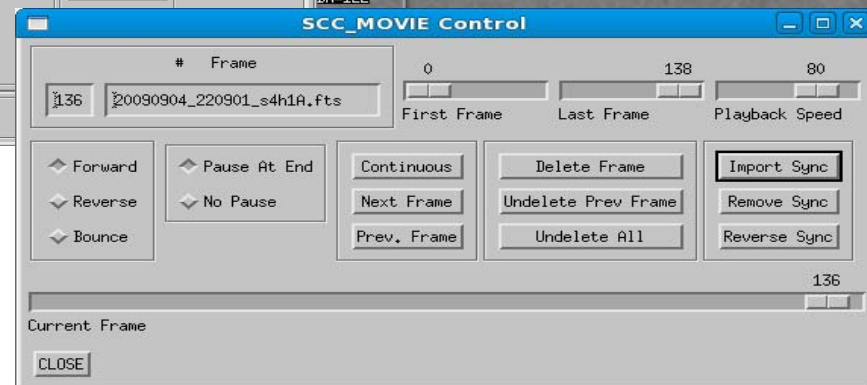
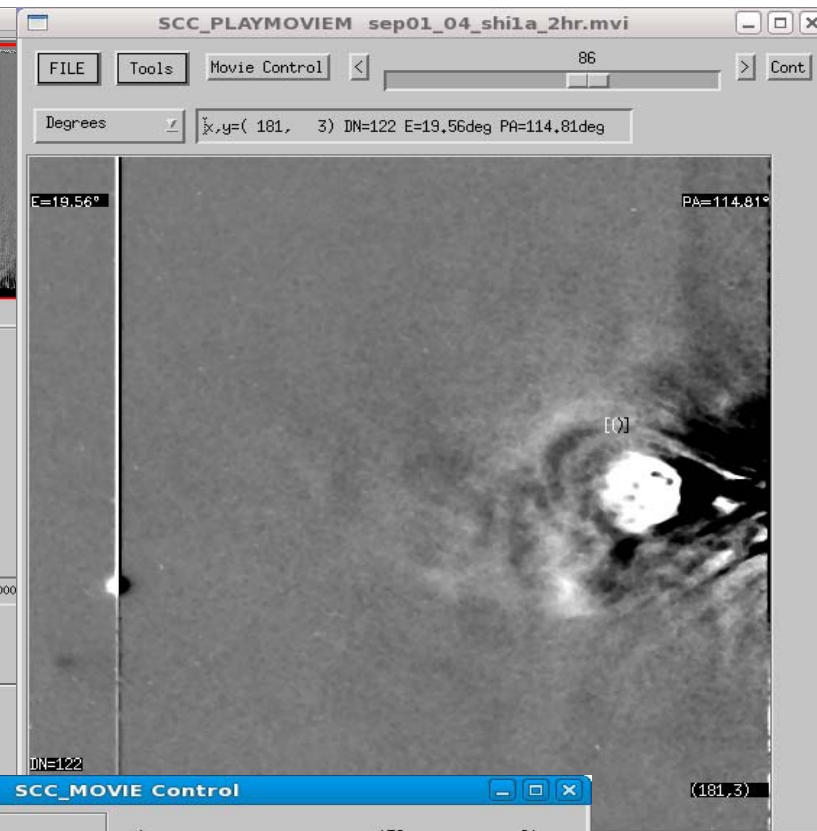
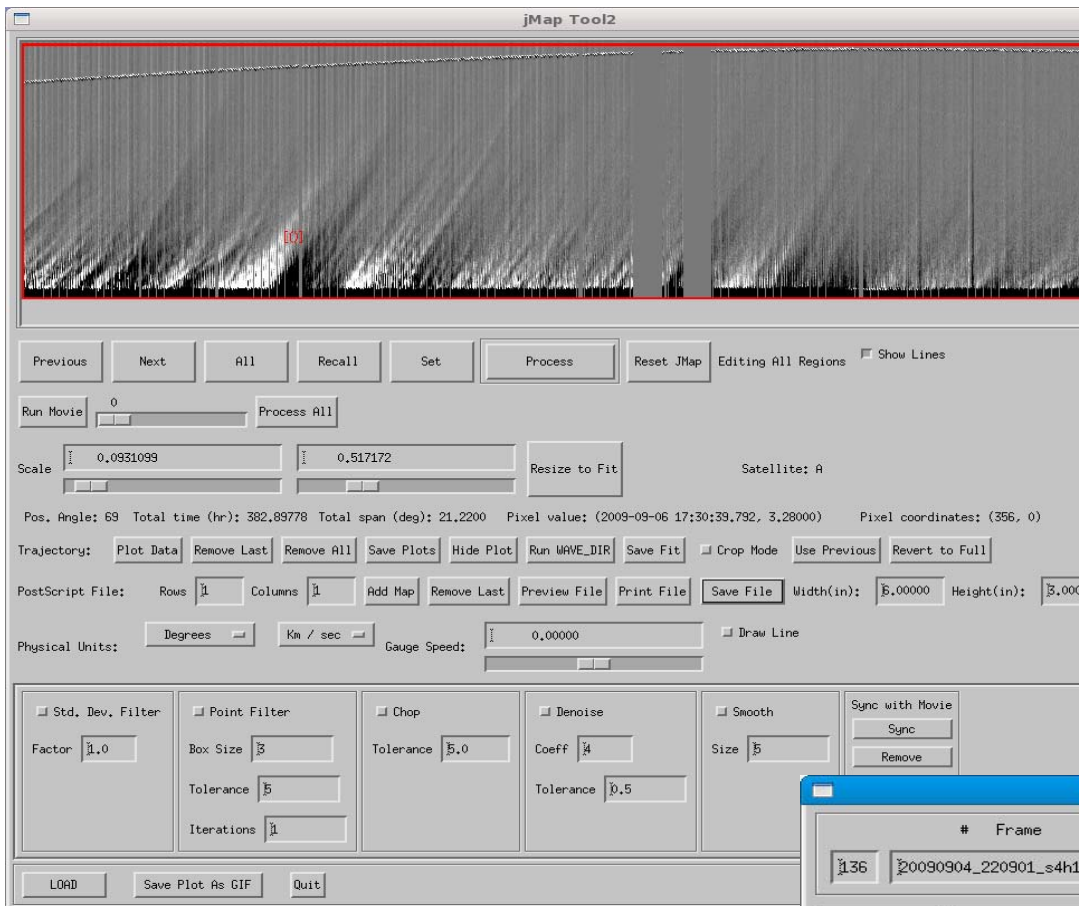


# SXPLOT\_HT





# Jmaps and Tool2a



- Movies serve as inputs to tool2a.pro**
- Jmaps created using tool2a.pro**
- Jmaps are HT plots along specified PA**
- Jmaps allow user to perform feature tracking**
- To Sync use the center mouse button**

# WSCC\_COMBINE\_MVI

Combines frames from existing .mvi/.hdr files from a combination of SECCHI telescopes into single frames at the correct relative platescale and orientation.

IDL> wsc\_combine\_mvi

SECCHI Combine Movie Tool

Movies to combine

|        |   |        |        |                      |        |
|--------|---|--------|--------|----------------------|--------|
| MVI0 : | <input type="text" value="/net/venus/secchi2/movie/euvi_02jan08a.mvi"/> | Select | MVI5 : | <input type="text"/> | Select |
| MVI1 : | <input type="text" value="/net/venus/secchi2/movie/cor1_02jan08a.mvi"/> | Select | MVI6 : | <input type="text"/> | Select |
| MVI2 : | <input type="text"/>  | Select | MVI7 : | <input type="text"/> | Select |
| MVI3 : | <input type="text"/>  | Select | MVI8 : | <input type="text"/> | Select |
| MVI4 : | <input type="text"/>  | Select | MVI9 : | <input type="text"/> | Select |

Proceed clear Quit Color : Grayscale B position : Same sun center Time Stamps: off

# WSCC\_COMBINE\_MVI: Control

The image displays two software windows. The left window, titled "SCC\_CMBMOVIE", shows a solar image with a green background and a central orange sun. It includes a menu bar with "FILE", "Tools", and "Controls", a frame counter set to "1", and a status bar at the bottom with the text "SECCHI 2008-01-02 COR1A 14:45:00 EUVA 14:46:15".

The right window, titled "SCC\_COMBINE\_MVI Control", is a control panel for the movie generation process. It features a "Combine\_MVI Controls" section with a text field containing "Not selected", "Crop" and "Clear Crop" buttons, a numerical input field with "228.91", a zoom slider, and a "Zoom: Select platescale value (arcsec/pixel)" label. Below this are "Restore Original Size", "Timestamp Charsize (0=none) 0.0", and "Preview", "Return to Setup", "Clear Text" buttons. The bottom of this section contains "Make Movie w/o img array", "Make/Save Movie", "Make img array" buttons, and an "Estimated MVI size = 315MB PNG or GIF movie size = 105MB" label, along with a "CLOSE" button.

The right side of the control panel is dedicated to "Masks" and "Background" settings. The "Masks" section includes a legend: "0 = No Mask" and "-1 = Use Mask File". It contains input fields for "HI2\_A", "HI2\_B", "COR2A", "COR2B", "COR1A", "COR1B", "EUVA", and "EUVB", each with a value of -1.00 or 3.500. The "Background" section has a "Movie Color" dropdown set to "Truecolor" and a "Background:" dropdown set to "Select". At the bottom, there are three sliders for "R:", "G:", and "B:", each with a value of 0.

# ANNOTATE\_IMAGE

IDL> annotate\_image ,[ 'some.mvi' or 'some\_image.gif']

**Annotations:**  
COR2-A  
EUVI 304 Å  
COR1  
SECCHI  
01/02/2008 13:56:00

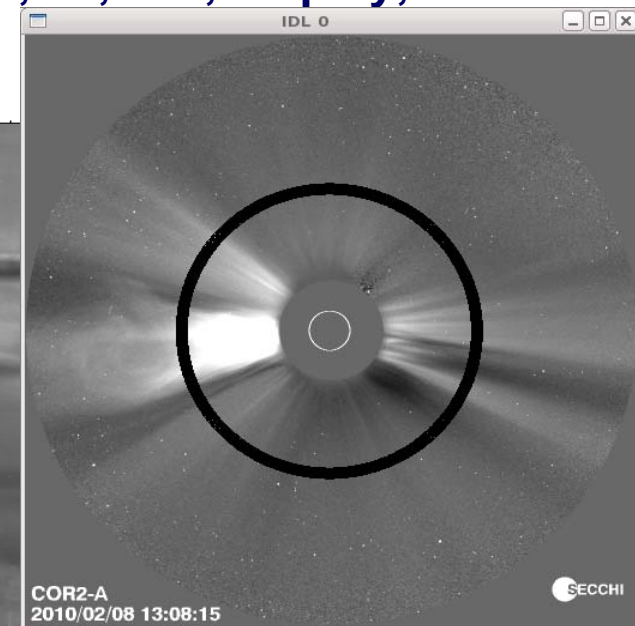
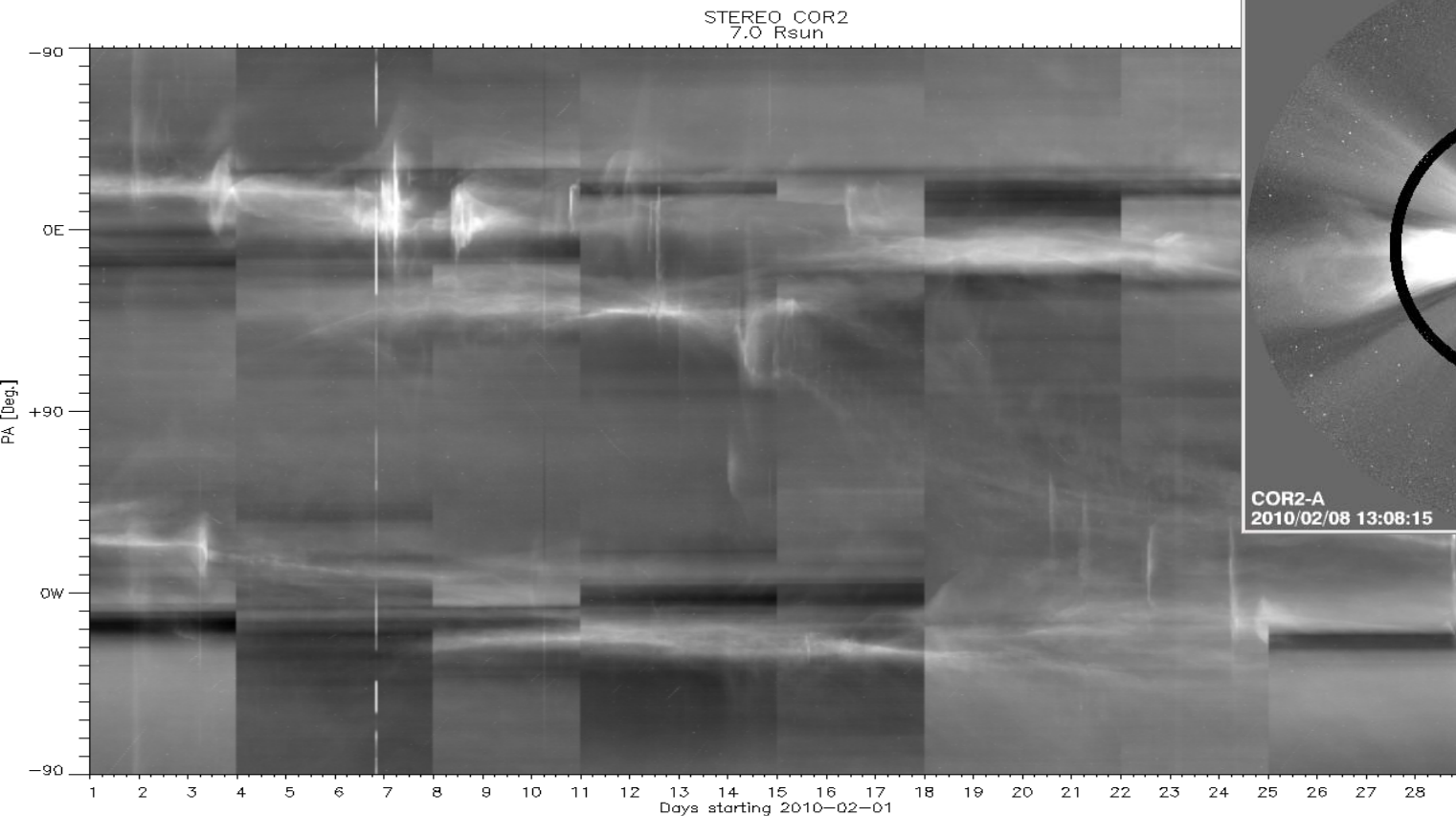
**Control Panel:**  
TEXT: MM/DD/YYYY hh:mm:ss [Clear]  
Vector Fonts: I3 - Simplex Roman (default) TrueType Fonts: !13 - Courier Bold [Show Font]  
Insert Embedded Command: !N - Shift back to the normal level and original character size.  
Select a Hardware Font (Embedded !-commands do not work with hardware fonts.)  
TEXT position: Click on image or X: 22 Y: 11 Align: Left Char Size: 2,00  
Orientation: 0  
ARROW: Select X1: 0 Y1: 0 X2: 0 Y2: 0 Thick: 2 Size: 8 [Clear]  
Text Color: White R: 255 G: 255 B: 255  
Background: none R: 255 G: 0 B: 0  
Arrow Color: Green R: 0 G: 255 B: 0  
MVI OPTIONS:  
- Not Selected  
- Add Time stamps  
- Add SECCHI Logo  
ADD ANNOTATION From Frame 0 To 132 [Help] [EXIT]  
Save MVI Save Image Output type: .png

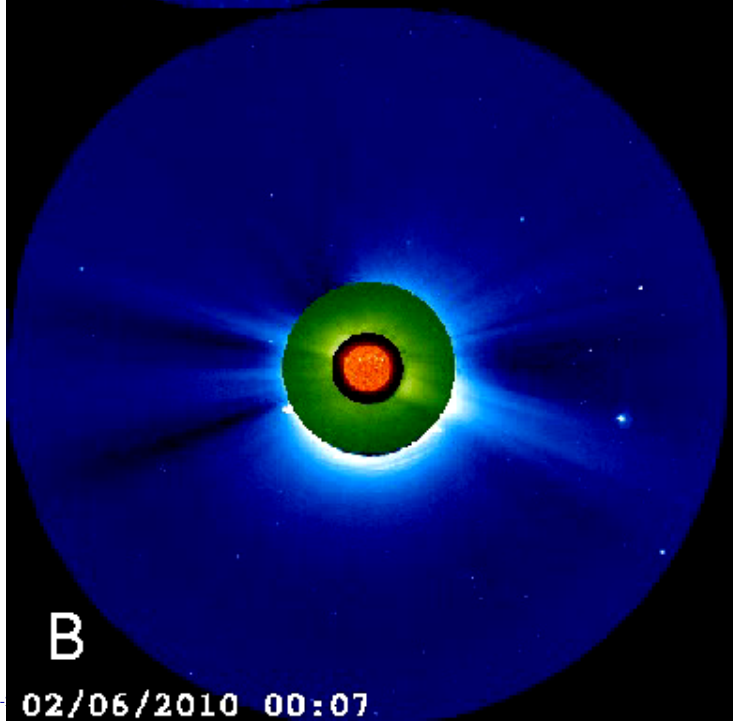
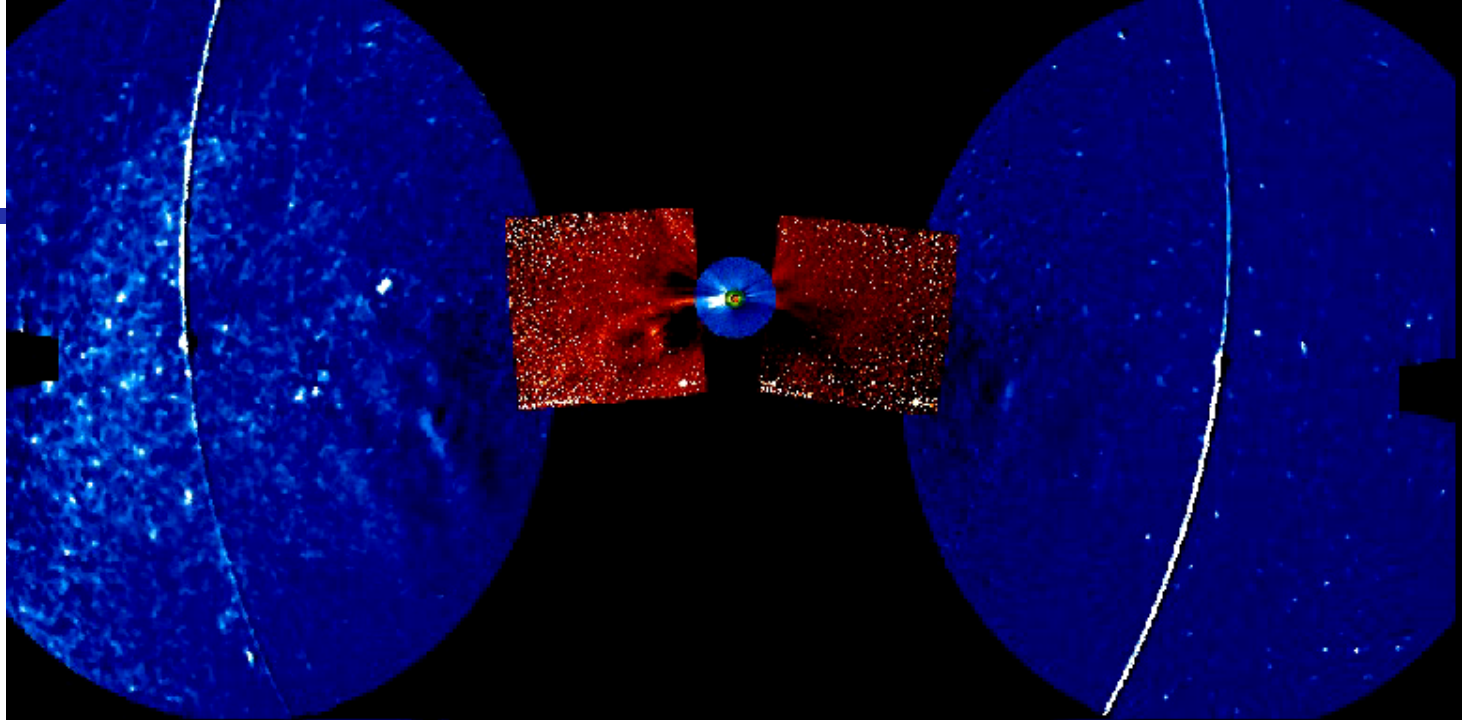
# MVI2CARRMAP

Creates Carrington/Synoptic maps from MVI movies

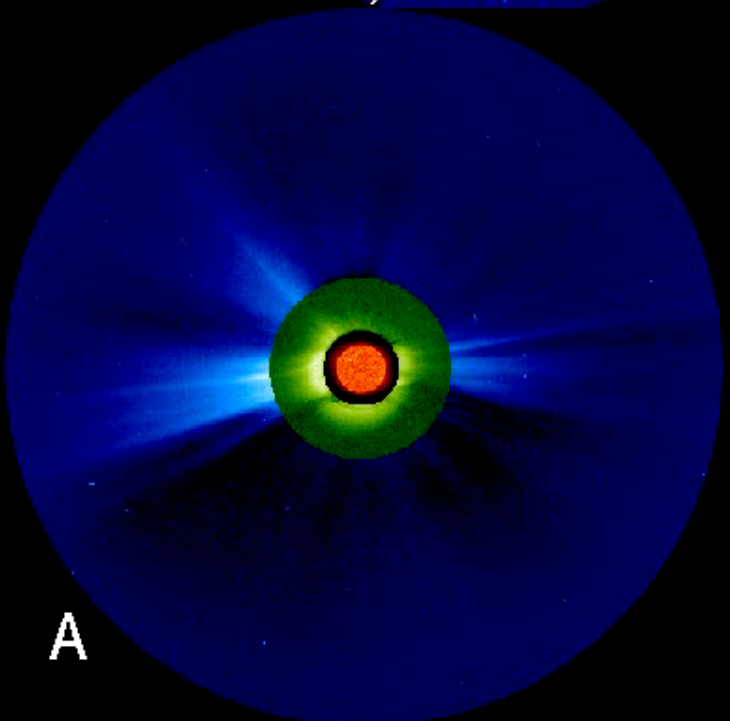
- Works for EIT/LASCO movies

```
IDL> mvi2carrmap,'201002/cor2a_0201_0228.mvi', 7.0, 10, .25 ,/display,  
/synoptic, png='synoptic'
```





B



A