

# BASS2000, HELIO, HFC

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# Some 'tools' available

- Databases: Give access to observations (/ models)
- Catalogues: information extracted from observations
- Tools to help for data identification
- VO tools

BASS2000





**HOME**

- Latest observations
- Latest movies
- Long term archive
- News

**QUERY**

- For observations
- For specific content
- For solar features
- For synoptic maps
- HELIO features cat.

**TOOLS**

- Ephemerids
- Solar spectrum
- Related topics
- Live Sun & webcams
- Software

**GUIDES**

- Instruments
- Data
- Software
- Educational resources (fr)

- Collection before 1980
- [Solar Web Guide](#)
- [Multimedia Gallery](#)

**LATEST OBSERVATIONS**


**MEUDON SPECTROHELIOGRAPH**



11-Oct-2014 13:22:09  
H Alpha prominences image

[.jpg](#)  
[.fits.Z](#)  
[solar grid](#)  
[image with grid](#)  
[others wavelengths or frequencies](#)

**CLIMSO PIC DU MIDI**



08-Oct-2014 11:48:12  
H Alpha coronagraphic image

[.png](#)  
[.fts](#)  
[movie](#)  
[C1/L1 surimpose](#)  
[others wavelengths or frequencies](#)

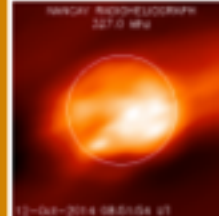
**COIMBRA SPECTROHELIOGRAPH**



12-Oct-2014 15:55:55  
CaII K1v image

[.jpg](#)  
[.fits](#)  
[solar grid](#)  
[others wavelengths or frequencies](#)


**NANCAY RADIOHELIOGRAPH**



12-Oct-2014 08:51:54  
327Mhz radio image

[.png](#)  
[.fits](#)  
[movie plots](#)  
[32/10s 128/120s](#)  
[others wavelengths or frequencies](#)

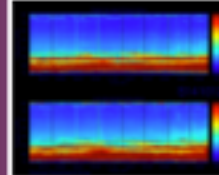
**USET-ROYAL OBSERVATORY OF BELGIUM**



12-Oct-2014 12:38:09  
H Alpha image

[.jpg](#)  
[.fts](#)  
[solar grid](#)

**NANCAY DECAMETRIC ARRAY**



12-Oct-2014 07:38:06  
10 sec integrated dynamic spectra, left and right hand polarization

[.png](#)  
[.fits](#)  
[full spectra](#)

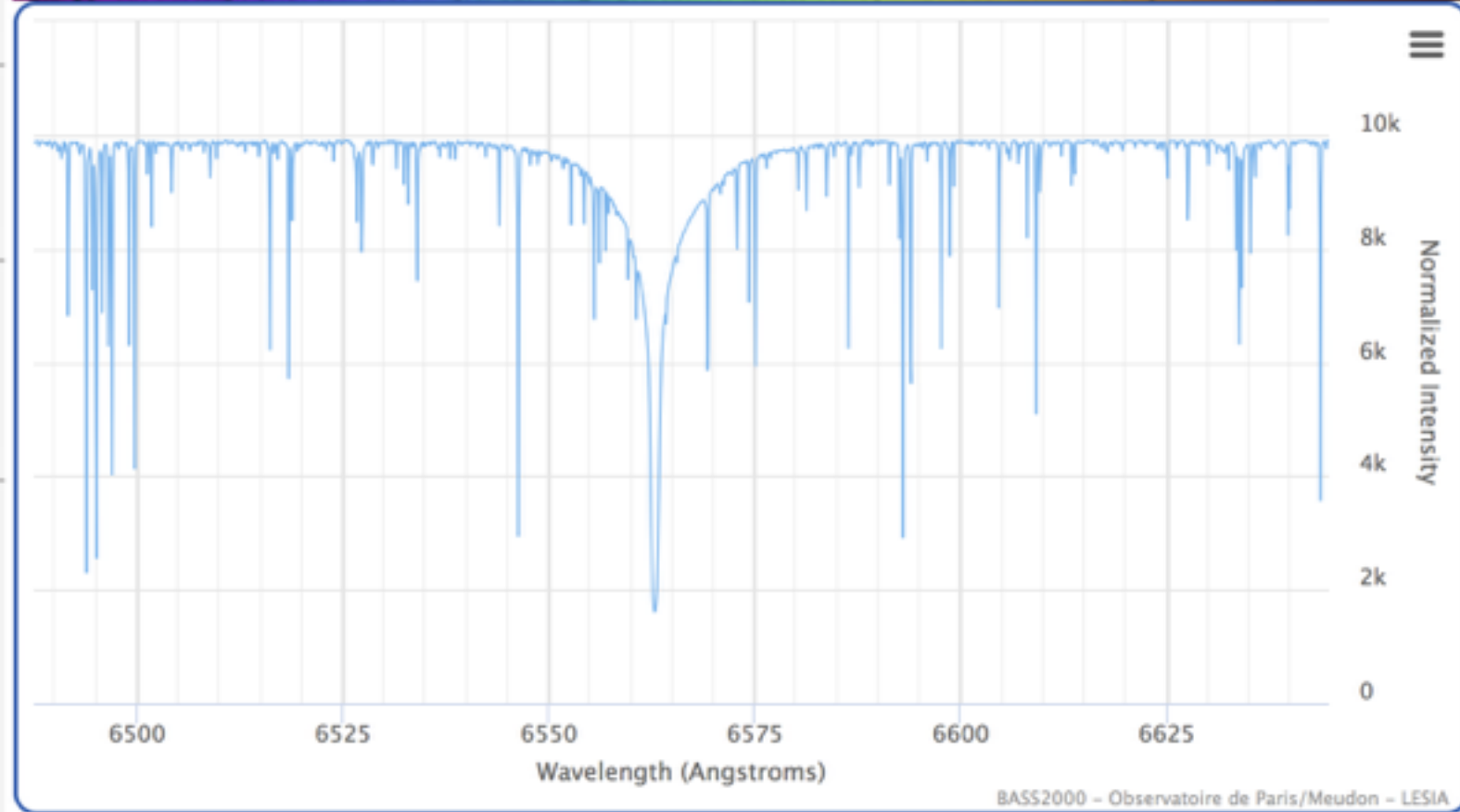
: to see/hide others observations

<http://bass2000.obspm.fr>



Bass2000

HIGH RESOLUTION SOLAR SPECTRUM



670-1609 Å  
&  
3000-54000 Å

Central wavelength (Å)

Detail from NIST and VAMDC databases for wavelength value: 6546.246

Results from NIST Atomic Spectra Database (National Institut of Standards and Technology):

Ion	Observed Wavelength Air (Å)	Ritz Wavelength Air (Å)	Aki (s-1)	fik	Acc.	Ei (cm-1)	Ek (cm-1)	gi-gk
Fe I	6546.239	6 546.2373	9.06e+05	4.16e-03	C	22 249.429	-37 521.161	7-5

This element is also found in VAMDC databases:

Database name	Element Symbol	Nuclear Charge	Wavelength	Upper State Energy	Upper State Energy Units	Lower State Energy	Lower State Energy Units
CHIANTI	Fe	26	6546.1184691087	9970077.0	1/cm	9954805.0	1/cm
VALD	Fe	26	6546.2419155678	4013460.0000	1/cm	543554.6700	1/cm
VALD	Fe	26	6546.2419155678	264532.1890	1/cm	577765.3710	1/cm

Use of VO tools (VAMDC)

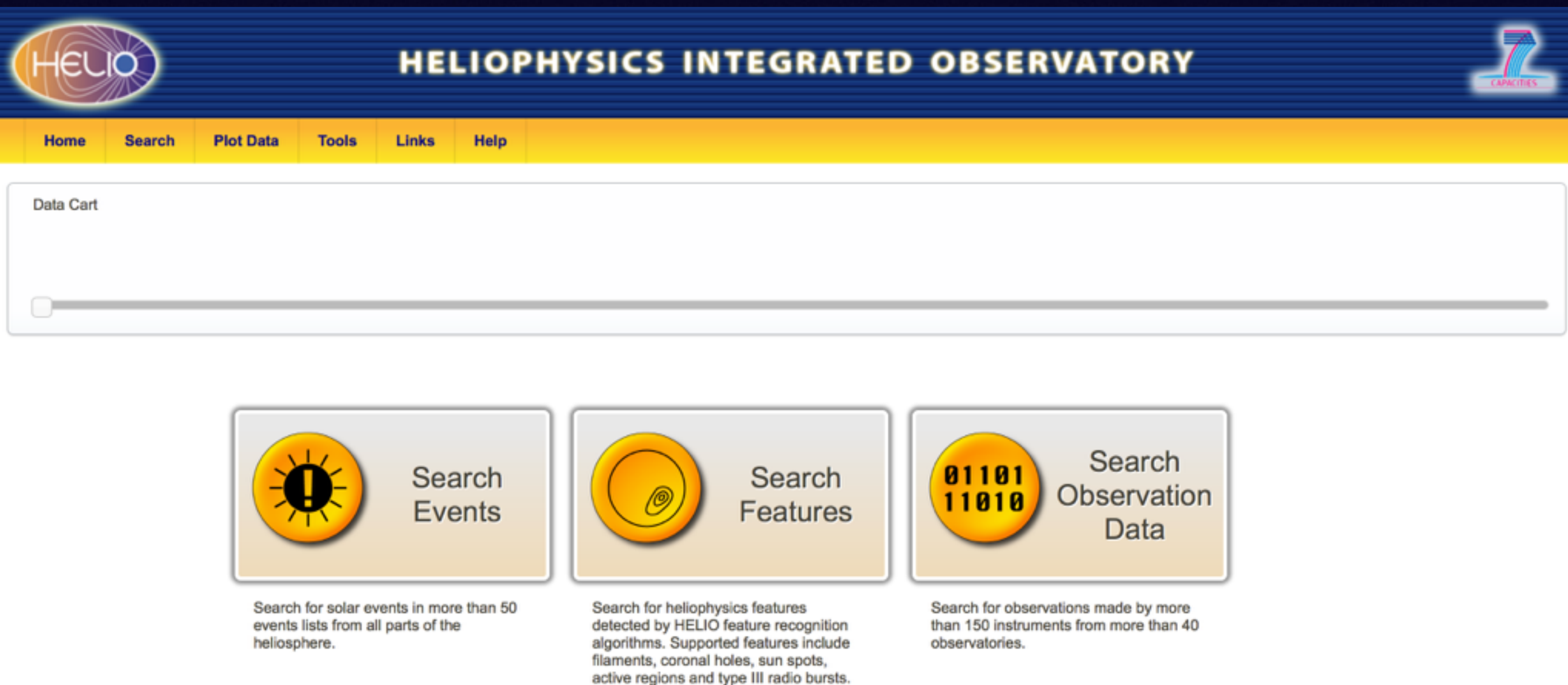
UV: from 670 Å to 1609 Å (SO)  
Visible: from 3000 Å to 10000 Å  
Infra Red: from 10000 Å to 50000 Å at 50000 Å)  
Note for visible and infrared:  
The normalization of the solar spectrum is normalized so that the continuum (it means that there is no discontinuity)  
Observers:  
UV: W. Curdt et al. (2001). The  
Download the introduction of  
Visible: Delbouille L., Neven  
Download the introduction of



# HELIO

(<http://hfe.helio-vo.eu/Helio>)

(or through <http://www.helio-vo.eu>)




**HELIO**


**HELIOPHYSICS INTEGRATED OBSERVATORY**

Home Search Plot Data Tools Links Help


Data Cart

 Search Events

Search for solar events in more than 50 events lists from all parts of the heliosphere.

 Search Features

Search for heliophysics features detected by HELIO feature recognition algorithms. Supported features include filaments, coronal holes, sun spots, active regions and type III radio bursts.

 Search Observation Data

Search for observations made by more than 150 instruments from more than 40 observatories.

# HELIO- Events

Data Cart  
Flare X1.2

## HELIO Event Catalogue

### Parameters

**Select Dates**

# 1 2005-07-12T00:00:00 – 2005-07-16T00:00:00 [Clear](#)

**Select an Event List**

GOES Soft X-ray Flare List [⚙](#)  
CACTus CME Catalogue for SOHO/LASCO [⚙](#) [Clear](#)

[Submit](#) Data successfully loaded!

### VOTable for task 'HELIO Event Catalogue'

[VOT](#) [i](#)

[helio\\_hec-goes\\_sxr\\_flare \(41\)](#) [helio\\_hec-cactus\\_soho\\_cme \(24\)](#)

[Show as table](#) [Show as plot](#)

[i](#) [🔄](#)

Show 50 entries

	time_start	time_peak	time_end	nar	lat_
🔍	2005-07-14T10:16:00	2005-07-14T10:55:00	2005-07-14T11:29:00	10786	11
🔍	2005-07-14T05:57:00	2005-07-14T07:25:00	2005-07-14T07:43:00	10786	9
🔍	2005-07-13T14:01:00	2005-07-13T14:49:00	2005-07-13T15:38:00	10786	11
🔍	2005-07-13T12:03:00	2005-07-13T12:19:00	2005-07-13T12:24:00	10786	8
🔍	2005-07-12T15:47:00	2005-07-12T16:24:00	2005-07-12T18:07:00	10786	9



# HELIO-Events

Data Cart  
Flare X1.2

## HELIO Event Catalogue

Parameters

Select Dates  
# 1 2005-07-12T00:00:00 – 2005-07-16T00:00:00 [Clear](#)

Select an Event List  
GOES Soft X-ray Flare List [⚙](#) [Clear](#)  
CACTus CME Catalogue for SOHO/LASCO [⚙](#) [Clear](#)

[Submit](#) Data successfully loaded!

able for task 'HELIO Event Catalogue'

[helio\\_hec-goes\\_sxr\\_flare \(41\)](#) [helio\\_hec-cactus\\_soho\\_cme \(24\)](#)

[Show as table](#) [Show as plot](#)

50 entries

time_start	time_peak	time_end	nar	lat_
2005-07-14T10:16:00	2005-07-14T10:55:00	2005-07-14T11:29:00	10786	11
2005-07-14T05:57:00	2005-07-14T07:25:00	2005-07-14T07:43:00	10786	9
2005-07-13T14:01:00	2005-07-13T14:49:00	2005-07-13T15:38:00	10786	11
2005-07-13T12:03:00	2005-07-13T12:19:00	2005-07-13T12:24:00	10786	8
2005-07-12T15:47:00	2005-07-12T16:24:00	2005-07-12T18:07:00	10786	9



# HELIO Propagation

Data Cart  
Flare X1.2

CME Forward Propagation Model (from Sun to objects)

Parameters

Select Dates  
Name Flare X1.2  
# 1 2005-07-14T10:50

Select Parameters

Submit

Select Parameter

Parameter	Value	
Longitude	211	Heliographic longitude in degrees (e.g., the position of a flare)
Width	296	Longitudinal width of the CME in degrees
Speed	1200	CME speed in km/s
SpeedError ±	100	Error in the speed in km/s

Name:

Provide a name to add this parameter set to your Data Cart.

Help Cancel Ok

# HELIO Propagation

## Select Dates



Name Flare X1.2  
# 1 2005-07-14T10:50:00

Clear

## Select Parameters



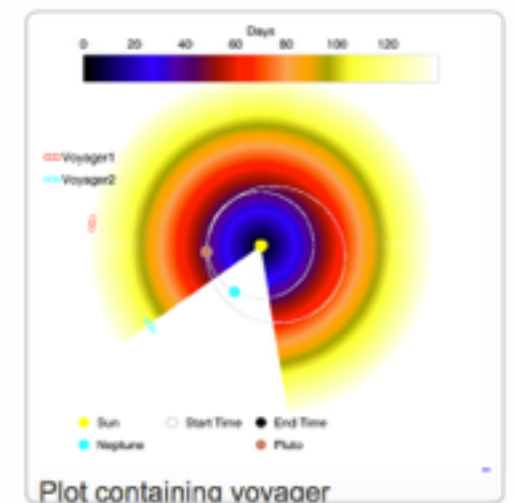
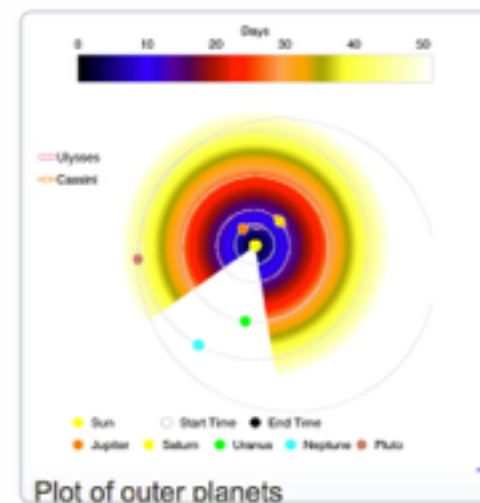
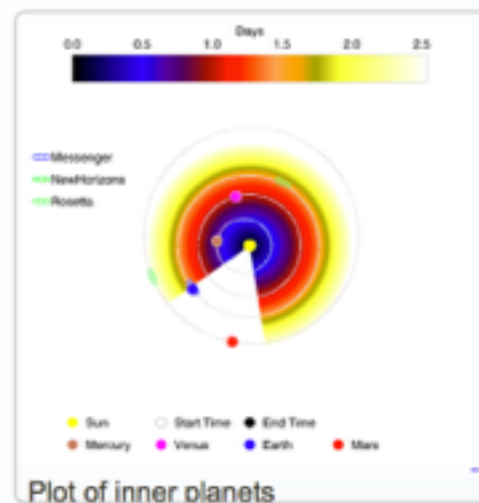
Longitude 211  
Width 296  
Speed 1200  
SpeedError  $\pm$  100

Clear

Submit

Data successfully loaded!

## Plots for task 'CME Forward Propagation Model (from Sun to objects)'



## VOTable for task 'CME Forward Propagation Model (from Sun to objects)'



# HELIO Propagation

time_start ▲	long_hg ⚡	long_hci ⚡	long_width ⚡	v ⚡	v_err ⚡	target_obj ⚡	r_hci ⚡	HitOrMiss ⚡	E
2005-07-14T10:50:00.000	211	67.19	296	1200	100	MERCURY	0.465	1	2005-07-14T22:4
2005-07-14T10:50:00.000	211	67.19	296	1200	100	VENUS	0.72	1	2005-07-15T11:4
2005-07-14T10:50:00.000	211	67.19	296	1200	100	EARTH	1.016	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	MARS	1.381	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	JUPITER	5.453	1	2005-07-22T04:3
2005-07-14T10:50:00.000	211	67.19	296	1200	100	SATURN	9.075	1	2005-07-27T18:0
2005-07-14T10:50:00.000	211	67.19	296	1200	100	URANUS	20.072	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	NEPTUNE	30.062	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	PLUTO	30.977	1	2005-09-04T01:0
2005-07-14T10:50:00.000	211	67.19	296	1200	100	ULYSSES	4.97	1	2005-07-22T00:0
2005-07-14T10:50:00.000	211	67.19	296	1200	100	MESSENGER	0.99	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	VOYAGER1	96.09	1	2005-12-02T00:0
2005-07-14T10:50:00.000	211	67.19	296	1200	100	VOYAGER2	76.97	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	CASSINI	9.08	1	2005-07-28T00:0
2005-07-14T10:50:00.000	211	67.19	296	1200	100	NEWHORIZONS	1.01	0	-
2005-07-14T10:50:00.000	211	67.19	296	1200	100	ROSETTA	1.44	1	2005-07-17T00:0



# HELIO/HFC

Heliophysics Feature Catalogue  
(<http://voparis-helio.obspm.fr/hfc-gui>)  
(or through BASS2000)

The screenshot shows the Heliophysics Feature Catalogue (HFC) website. At the top, there is a logo for HELIO and the text 'Heliophysics Feature Catalogue' next to a logo for CAPACITIES. Below the header, there is a paragraph explaining the HFC: 'The Heliophysics Feature Catalogue (HFC) provides access to existing solar and heliophysics feature data, extracted from images by automated recognition codes. The catalogue contains geometrical (e.g., gravity center coordinates, contours, area, etc.) and photometric feature parameters (e.g., average, minimum, and maximum intensity, etc.) , but also tracking information to identify co-rotating feature on the solar disc.'

Navigation buttons include: Query form, Database and fields description, Database content, Free SQL query, Hello Front End.

The 'Query form' section has three tabs: 1 - Date and time selection, 2 - Features selection, 3 - Output options. Below the tabs, there is a note: 'If 'From' and 'to' are empty, date selection is ignored and query applies to the whole database!'. There are input fields for 'From' and 'to', and a 'Duration between 0 and 60 days' field. An 'Upload dates sample from VOTable' button is also present. A 'Submit' button is at the bottom right of the form.

Below the form, a table provides the list of features for which data are currently available in the HFC. The table has five columns: Feature, Instrument, Recognition code, Bibliography, and Tracking information.

Feature	Instrument	Recognition code	Bibliography	Tracking information
Active Region	SOHO/MDI SOHO/EIT (171/195 A) SDO/AIA (171/193 A)	SMART	Higgins et al., 2010	No
		SPOCA-AR	Barra et al., 2009	Yes
		SPOCA-AR	Barra et al., 2009	Yes
Coronal Hole	SOHO/MDI + SOHO/EIT (195 A) SOHO/EIT (171/195 A) SDO/AIA (193 A)	CHARM	Krista and Gallagher, 2009	No
		SPOCA-CH	Barra et al., 2009	Yes
		SPOCA-CH	Barra et al., 2009	Yes
Filament	Meudon H Alpha Spectroheliograph	SoSoft & TrackFil	Fuller et al., 2005 - Bonnín et al., 2013	Yes
Prominence	Meudon CAII K3 Spectroheliograph	SoSoPro	N. Fuller	No
Sunspot	SOHO/MDI SDO/HMI	MDISS	Zharkov et al., 2005	No
		SDOSS	Zharkov et al., 2005	Yes
Type III	Wind/Waves, STEREO/Swaves	RABAT3	X. Bonnín	No
Coronal radio emission	Nancay Radio Heliograph	NRH2D	C. Renié, X. Bonnín	Yes

Navigation buttons at the bottom: Query form, Database and fields description, Database content, Free SQL query, Hello Front End, API, Web Services, About HFC.

Logos for Observatoire de Paris, LESIA, and IAS are at the bottom. Text at the bottom: 'Laboratoire d'Etudes Spatiales et d'Instrumentation en Astrophysique FP7, project No. 238969'.

# HELIO/HFC

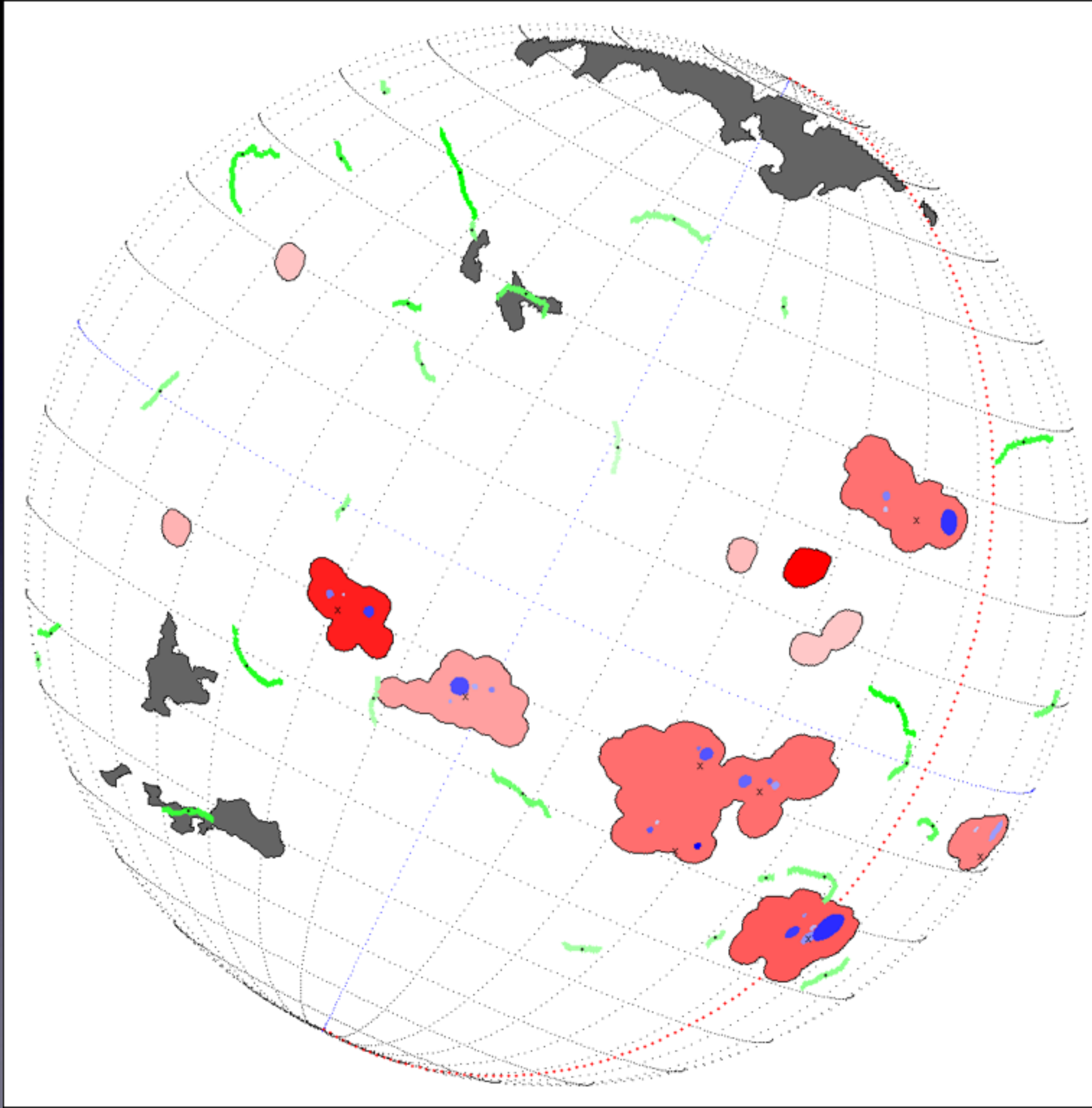
## Heliophysics Feature Catalogue

(<http://voparis-helio.obspm.fr/hfc-gui>)

(or through BASS2000)

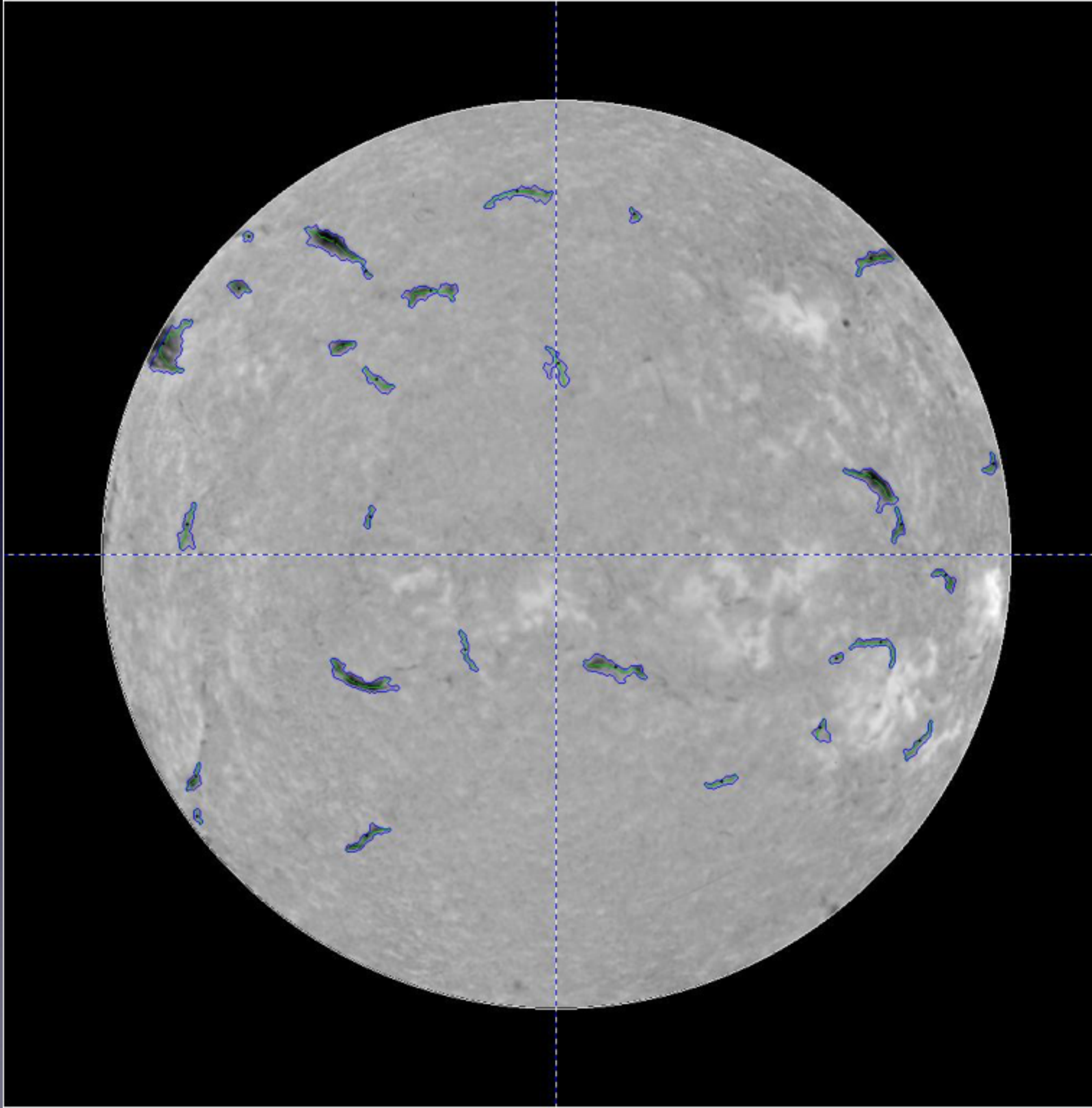
Feature	Instrument
Active Region	SOHO/MDI SOHO/EIT (171/195 A) SDO/AIA (171/193 A)
Coronal Hole	SOHO/MDI + SOHO/EIT (195 A) SOHO/EIT (171/195 A) SDO/AIA (193 A)
Filament	Meudon H Alpha Spectroheliograph
Prominence	Meudon CAII K3 Spectroheliograph
Sunspot	SOHO/MDI SDO/HMI
Type III	Wind/Waves, STEREO/Swaves
Coronal radio emission	Nancay Radio Heliograph

# HELIO/ HFC





HELIO/  
HFC

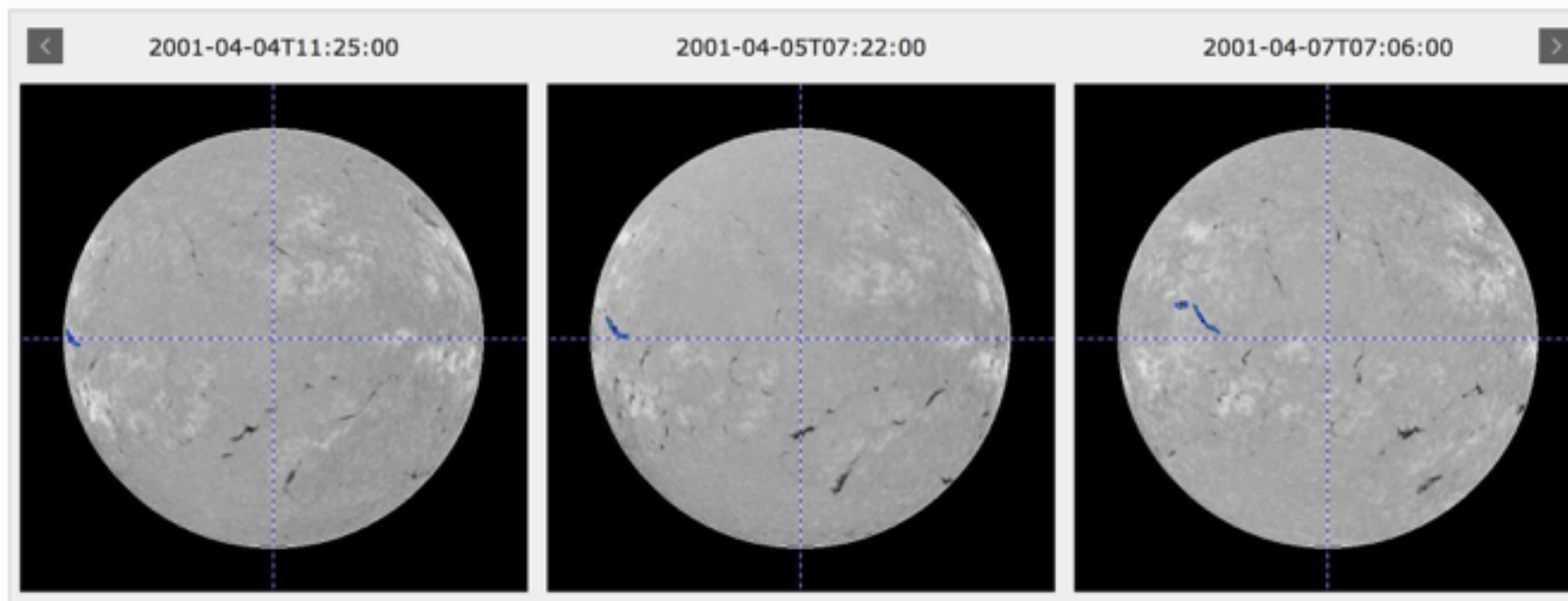




Tabular result

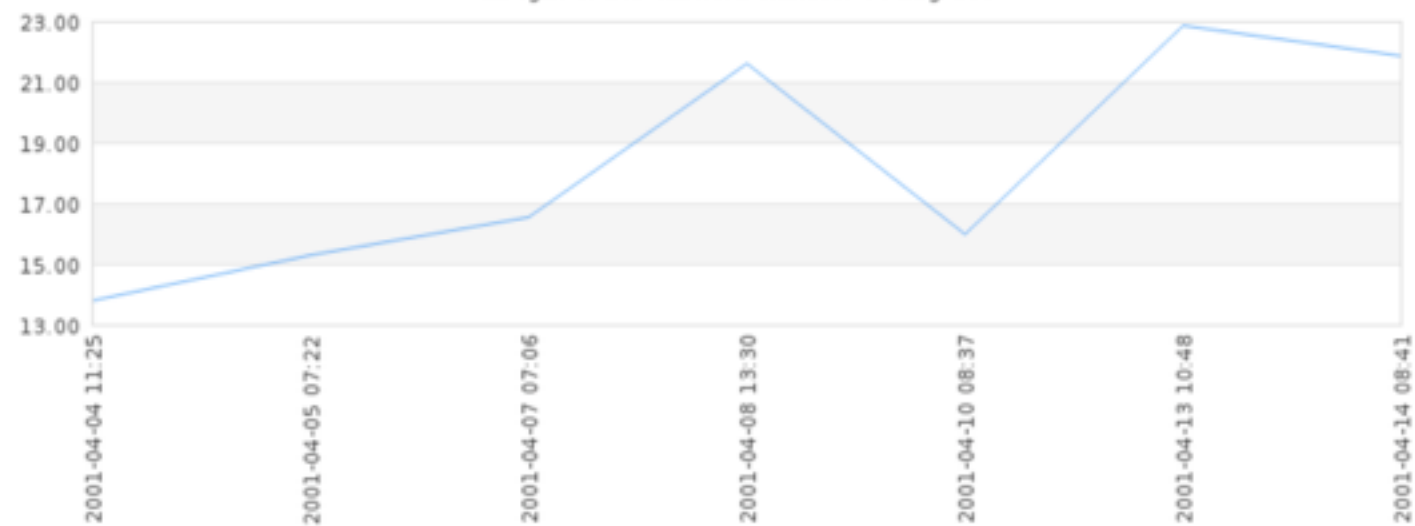
Show 10 entries

Index of the feature during a rotation Click for tracking info	Id of filament's component(s)	Name of the observatory/spacecraft	Phenomenon	Carrington latitude of the filament skeleton in degrees	Carrington longitude of the filament skeleton in degrees	Length of the filament skeleton in degrees	Link to the SHEBA forward propagation model
<a href="#">30941</a> 2001-04-04 to 2001-04-13	31119	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	Reappearance after disparition brusque	-26.87	370.74	8.55	<a href="#">CME</a>
<a href="#">30954</a> 2001-04-04 to 2001-04-14	31126 31128 31130	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-5.61 -0 5.54	366.51 356.54 351.65	6.58 5.67 10.61	<a href="#">CME</a> <a href="#">CME</a> <a href="#">CME</a>
<a href="#">30983</a> 2001-04-05 to 2001-04-14	31120	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-26.8	347.78	3.1	<a href="#">CME</a>
<a href="#">30989</a> 2001-04-04 to 2001-04-14	31124 31125	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-15.06 -17.65	354.83 347.5	11.06 1.99	<a href="#">CME</a> <a href="#">CME</a>
<a href="#">31007</a> 2001-04-05 to 2001-04-13	31139	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	Reappearance after disparition brusque	37.95	368.56	19.98	<a href="#">CME</a>
<a href="#">31057</a> 2001-04-08 to 2001-04-18	31122	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-20.01	315.36	9.62	<a href="#">CME</a>
<a href="#">31065</a> 2001-04-08 to 2001-04-19	31123	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-17.7	295.33	6.12	<a href="#">CME</a>
<a href="#">31082</a> 2001-04-10 to 2001-04-18	31115	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-42.96	272.78	11.67	<a href="#">CME</a>
<a href="#">31091</a> 2001-04-10 to 2001-04-17	31121	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	-21.38	279.28	10.85	<a href="#">CME</a>
<a href="#">31112</a> 2001-04-10 to	31138	MEUDON/SPECTROHELIOGRAPH/SPECTROHELIOGRAPH	-	33.45	277.33	2.57	<a href="#">CME</a>

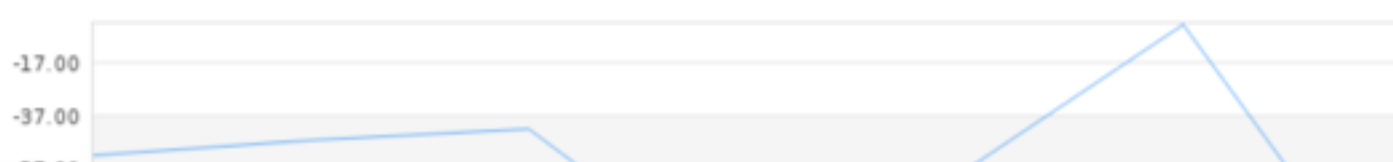


Observation date	Phenomen	Filament part ID	Length (dg)	Filament component(s)		
				Orientation (dg)	Longitude (dg)	Latitude (dg)
2001-04-04T11:25:00	-	30954	13.82	-52.38	-10.41	-1.85
2001-04-05T07:22:00	-	30998	15.34	-46.72	-7.86	-0.63
2001-04-07T07:06:00	-	31030	12.73	-48.53	-7.91	-0.25
		31031	3.83	6	-15.64	4.96
2001-04-08T13:30:00	-	31066	5.14	-30.46	4.94	-4.88
		31067	4.54	-42.51	-6.18	-0.95
		31068	11.92	-31.36	-10.64	5.53
2001-04-10T08:37:00	-	31103	8.53	-46.81	353.36	-0.01
		31105	7.49	-11.61	348.6	6.29
2001-04-13T10:48:00	-	31126	6.58	-44.67	366.51	-5.61
		31128	5.67	83.62	356.54	-0
		31130	10.61	-41.74	351.65	5.54
2001-04-14T08:41:00	-	31158	7.27	-58.6	368.01	-5.73
		31159	3.83	-2.32	356.2	-1.06
		31160	10.75	-55.35	354.3	4.39

Length of the filament skeleton in degrees



Orientation of the filament skeleton



# VO tools

- Use of IVOA standards
  - FITS



# VO tools

- Use of IV
- FITS

The screenshot displays the Aladin v6.0 software interface. At the top, the title bar reads "Aladin v6.0". Below the title bar, there are several input fields: "Position", "XY linear", "Pixel", and "full". The main window shows a grayscale image of the Moon with various labels and a scale bar. The scale bar at the bottom left indicates "1'" and the dimensions of the image are "22.06' x 19.33'". The image is surrounded by a coordinate grid with labels "N", "E", "M", and "O".

On the right side, there is a vertical toolbar with icons for "select", "dépl.", "zoom", "dist", "dessin", "marq", "texte", "filtre", "corr.", "rvb", "assoc", "cont", "loupe", "pixel", "prop", and "suppr". Below the toolbar is a panel with a list of layers:

- Blk img
- mk010525.063900
- mk010525.063600
- mh010525.063400

The "Zoom" level is set to "1/2x". The "Zoom" range is shown as "0" to "4079". At the bottom right, there is a search field labeled "Chercher" and several navigation icons.



# VO tools

- Use of IVOA standards
  - FITS
  - XML

# VO tools

The image shows a screenshot of the TOPCAT software interface. The main window is titled "TOPCAT(1): Table Browser" and displays a table with 20 rows of data. The table columns are: goes\_id, ntime\_start, time\_start, time\_peak, time\_end, ntime\_end, nar, latitude, longitude, long\_carr, xray\_cl..., and optical... The data rows contain various astronomical parameters and timestamps.

In the background, a file explorer window titled "ADRIDL21D\_DIR" is visible, showing a directory structure with folders like "10040104", "10040108", "ADRIDL2\_DIR", "ADRIDL21D\_DIR", "Donnes\_brutes", and "Photos". The file explorer also shows a list of files including "adridl\_21.pro", "ADRIDL\_CALL.pro", "ADRIDL21.bat", "ADRIDL21D\_files.zip", "ANOT\_JPEG3.pro", "banner.sav", "break\_path.pro", "check\_fits.pro", "daycnv.pro", "DIG\_2.pro", "DIG\_CORRECTIONS2.pro", "DIG\_DISK.pro", "DIG\_DOPPL.pro", and "DIG\_FITS - copie.pro".

The TOPCAT interface includes a "Table List" on the left, "Current Table Properties" in the center, and a "SAMP" section at the bottom. The "Current Table Properties" section shows the following details:

- Label: sec1\_20100604\_064920.xml
- Location: /Applications/VO/sec1\_20100604\_064920.xml
- Name: sec1\_20100604\_064920.xml
- Rows: 192
- Columns: 12
- Sort Order: (indicated by an upward arrow)
- Row Subset: All

The "Table Browser for 1: sec1\_20100604\_064920.xml" window displays the following data:

	goes_id	ntime_start	time_start	time_peak	time_end	ntime_end	nar	latitude	longitude	long_carr	xray_cl...	optical...
1	50258	2001-05-04 10:30:00	2001-05-04 10:44:00	2001-05-04 10:58:00	2001-05-04 11:04:00	2001-05-04 11:46:00	9445	25,	-7,	23,07	C1.4	sf
2	50259	2001-05-04 14:20:00	2001-05-04 14:40:00	2001-05-04 15:00:00	2001-05-04 15:55:00	2001-05-04 22:20:00	9447	12,	35,	62,9	C4.1	sf
3	50260	2001-05-04 17:10:00	2001-05-04 18:18:00	2001-05-04 19:26:00	2001-05-04 20:00:00	2001-05-04 23:58:00					C3.0	
4	50261	2001-05-05 08:28:00	2001-05-05 08:42:00	2001-05-05 08:56:00	2001-05-05 09:15:00	2001-05-05 11:28:00	9445	25,	6,	23,97	M1.0	1f
5	50262	2001-05-05 17:54:00	2001-05-05 18:07:00	2001-05-05 18:20:00	2001-05-05 18:34:00	2001-05-05 20:12:00	9445	24,	13,	25,78	C6.3	sf
6	50263	2001-05-05 20:45:00	2001-05-05 21:00:00	2001-05-05 21:15:00	2001-05-05 21:21:00	2001-05-05 22:03:00					B9.3	
7	50264	2001-05-06 10:33:00	2001-05-06 10:46:00	2001-05-06 10:59:00	2001-05-06 11:08:00	2001-05-06 12:11:00					B8.0	
8	50265	2001-05-06 11:32:00	2001-05-06 11:40:00	2001-05-06 11:48:00	2001-05-06 11:58:00	2001-05-06 13:08:00					C2.8	
9	50266	2001-05-06 19:14:00	2001-05-06 19:17:00	2001-05-06 19:20:00	2001-05-06 19:23:00	2001-05-06 19:44:00					B5.9	
10	50267	2001-05-06 18:51:00	2001-05-06 19:31:00	2001-05-06 20:11:00	2001-05-06 20:31:00	2001-05-06 22:51:00	9445	24,	28,	26,79	C7.9	sf
11	50268	2001-05-07 02:17:00	2001-05-07 03:10:00	2001-05-07 02:45:00	2001-05-07 02:50:00	2001-05-07 03:25:00					B7.7	
12	50269	2001-05-07 03:53:00	2001-05-07 03:58:00	2001-05-07 04:03:00	2001-05-07 04:22:00	2001-05-07 06:35:00					B6.2	
13	50270	2001-05-07 06:16:00	2001-05-07 06:20:00	2001-05-07 06:24:00	2001-05-07 06:27:00	2001-05-07 06:48:00					B7.7	
14	50271	2001-05-07 06:21:00	2001-05-07 06:32:00	2001-05-07 06:43:00	2001-05-07 06:56:00	2001-05-07 08:27:00					C1.0	
15	50272	2001-05-07 10:52:00	2001-05-07 11:36:00	2001-05-07 12:20:00	2001-05-07 12:43:00	2001-05-07 15:24:00	9445				C3.9	
16	50273	2001-05-07 15:09:00	2001-05-07 15:34:00	2001-05-07 15:59:00	2001-05-07 16:16:00	2001-05-07 18:15:00	9445	24,	40,	27,74	C2.2	sf
17	50274	2001-05-07 18:07:00	2001-05-07 18:19:00	2001-05-07 18:31:00	2001-05-07 18:46:00	2001-05-07 20:31:00					C1.7	
18	50275	2001-05-08 00:17:00	2001-05-08 00:36:00	2001-05-08 00:55:00	2001-05-08 01:17:00	2001-05-08 03:51:00	9445	23,	43,	25,77	C9.9	1f
19	50276	2001-05-08 09:26:00	2001-05-08 09:29:00	2001-05-08 09:32:00	2001-05-08 09:35:00	2001-05-08 09:56:00					B6.4	
20	50277	2001-05-08 15:58:00	2001-05-08 16:10:00	2001-05-08 16:22:00	2001-05-08 16:31:00	2001-05-08 17:34:00					C1.6	



# VO tools

The screenshot displays the TOPCAT software interface. The main window is titled 'TOPCAT(1): Table Browser' and shows a table with 20 rows of astronomical data. The table columns include observation ID, start and end times, peak time, and various parameters like 'nar', 'latitude', 'longitude', 'long\_carr', 'xray\_cl...', and 'optical...'. The data is sorted by 'nar' in descending order.

Table Browser for 1: sec1\_20100604\_064920.xml

	goes_id	ntime_start	time_start	time_peak	time_end	ntime_end	nar	latitude	longitude	long_carr	xray_cl...	optical...
1	50258	2001-05-04 10:30:00	2001-05-04 10:44:00	2001-05-04 10:58:00	2001-05-04 11:04:00	2001-05-04 11:46:00	9445	25,	-7,	23,07	C1.4	sf
2	50259	2001-05-04 14:20:00	2001-05-04 14:40:00	2001-05-04 15:00:00	2001-05-04 15:55:00	2001-05-04 22:20:00	9447	12,	35,	62,9	C4.1	sf
3	50260	2001-05-04 17:10:00	2001-05-04 18:18:00	2001-05-04 19:26:00	2001-05-04 20:00:00	2001-05-04 23:58:00					C3.0	
4	50261	2001-05-05 08:28:00	2001-05-05 08:42:00	2001-05-05 08:56:00	2001-05-05 09:15:00	2001-05-05 11:28:00	9445	25,	6,	23,97	M1.0	1f
5	50262	2001-05-05 17:54:00	2001-05-05 18:07:00	2001-05-05 18:20:00	2001-05-05 18:34:00	2001-05-05 20:12:00	9445	24,	13,	25,78	C6.3	sf
6	50263	2001-05-05 20:45:00	2001-05-05 21:00:00	2001-05-05 21:15:00	2001-05-05 21:21:00	2001-05-05 22:03:00					B9.3	
7	50264	2001-05-06 10:33:00	2001-05-06 10:46:00	2001-05-06 10:59:00	2001-05-06 11:08:00	2001-05-06 12:11:00					B8.0	
8	50265	2001-05-06 11:32:00	2001-05-06 11:40:00	2001-05-06 11:48:00	2001-05-06 11:58:00	2001-05-06 13:08:00					C2.8	
9	50266	2001-05-06 19:14:00	2001-05-06 19:17:00	2001-05-06 19:20:00	2001-05-06 19:23:00	2001-05-06 19:44:00					B5.9	
10	50267	2001-05-06 18:51:00	2001-05-06 19:31:00	2001-05-06 20:11:00	2001-05-06 20:31:00	2001-05-06 22:51:00	9445	24,	28,	26,79	C7.9	sf
11	50268	2001-05-07 02:17:00	2001-05-07 03:10:00	2001-05-07 02:45:00	2001-05-07 02:50:00	2001-05-07 03:25:00					B7.7	
12	50269	2001-05-07 03:53:00	2001-05-07 03:58:00	2001-05-07 04:03:00	2001-05-07 04:22:00	2001-05-07 06:35:00					B6.2	
13	50270	2001-05-07 06:16:00	2001-05-07 06:20:00	2001-05-07 06:24:00	2001-05-07 06:27:00	2001-05-07 06:48:00					B7.7	
14	50271	2001-05-07 06:21:00	2001-05-07 06:32:00	2001-05-07 06:43:00	2001-05-07 06:56:00	2001-05-07 08:27:00					C1.0	
15	50272	2001-05-07 10:52:00	2001-05-07 11:36:00	2001-05-07 12:20:00	2001-05-07 12:43:00	2001-05-07 15:24:00	9445				C3.9	
16	50273	2001-05-07 15:09:00	2001-05-07 15:34:00	2001-05-07 15:59:00	2001-05-07 16:16:00	2001-05-07 18:15:00	9445	24,	40,	27,74	C2.2	sf
17	50274	2001-05-07 18:07:00	2001-05-07 18:19:00	2001-05-07 18:31:00	2001-05-07 18:46:00	2001-05-07 20:31:00					C1.7	
18	50275	2001-05-08 00:17:00	2001-05-08 00:36:00	2001-05-08 00:55:00	2001-05-08 01:17:00	2001-05-08 03:51:00	9445	23,	43,	25,77	C9.9	1f
19	50276	2001-05-08 09:26:00	2001-05-08 09:29:00	2001-05-08 09:32:00	2001-05-08 09:35:00	2001-05-08 09:56:00					B6.4	
20	50277	2001-05-08 15:58:00	2001-05-08 16:10:00	2001-05-08 16:22:00	2001-05-08 16:31:00	2001-05-08 17:34:00					C1.6	

# VO tools

- Use of IVOA standards
  - FITS
  - XML
  - EuroPlaNet Table Access Protocol (EPN-TAP)

BASS2000 and HFC



# Conclusion

- Data and tools already exist
- They need to be maintained on the long term (i.e. not only project driven)
- Existing standards should be followed, and new ones developed when needed -> heliophysics community more active in IVOA