

# BASS2000 and HELIO

## Dataset and added-values

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# BASS2000

(what it looks like)

The screenshot shows the BASS2000 Solar Survey Archive website. At the top, it displays the title 'BASS2000 Solar Survey Archive' and the date '17 Nov 2013 11:48 UT'. Below the title is a search bar with a date input field set to '17/11/2013' and buttons for 'Previous day', 'OK', and 'Next day'. There are also language selection buttons for 'en' and 'fr', and a 'My Selection' button. The main content area is titled 'LATEST OBSERVATIONS' and features several observation cards. Each card includes a thumbnail image, a title, a date and time, a description of the observation, and a list of available file formats. The cards are: 'MEUDON HELIOGRAPH' (CaIIR integrated image), 'USET-ROYAL OBSERVATORY OF BELGIUM' (H Alpha image), 'MEUDON SPECTROHELIOGRAPH' (H Alpha image), 'CLIMSO PIC DU MIDI' (H Alpha coronagraphic image), 'COIMBRA SPECTROHELIOGRAPH' (CaII K3 image), 'NANCAY RADIOHELIOGRAPH' (150.9Mhz radio image), and 'NANCAY DECAMETRIC ARRAY' (10 sec integrated dynamic spectra). A left sidebar contains navigation links for 'HOME', 'QUERY', 'TOOLS', and 'GUIDES'. A right sidebar contains a 'Corona' logo and a '327 MHz' indicator.

Photosphere/  
Chromosphere

Corona



# BASS2000

(what to find there)

- Full Sun images ( $H\alpha$ , Ca II H/K) (currently  $\approx 20$  years of data, and soon 1 century)
- Low corona (prominences, coronagraphy)
- Higher corona (radio m and dm)
- Solar spectrum (600-50,000 Å)
- Ephemerids
- Synoptic maps and solar features

# HELIO

(What it looks like)



Propagation model

Event query  
( $\approx 70$  catalogues)

Feature catalogue

Context

Data query  
( $\approx 200$  datasets)

Instrument query

# HELIO

## Heliophysics Feature Catalogue

### Collaboration

- \* Paris Obs
- \* TCD (Dublin)
- \* MSSL/UCL

The screenshot shows the HELIO Heliophysics Feature Catalogue website. At the top, there is a logo for HELIO and a logo for CAPACITIES. Below the logos, there is a navigation menu with buttons for 'Query form', 'Database and fields description', 'Database content', 'Free SQL query', and 'Helio Front End'. The 'Query form' button is selected, and the page displays a form for date and time selection. The form has three tabs: '1 - Date and time selection', '2 - Features selection', and '3 - Output options'. The '1 - Date and time selection' tab is active. Below the tabs, there is a text box with a help icon and the text: 'If 'From' and 'to' are empty, date selection is ignored and query applies to the whole database!'. Below this text box, there are two input fields: 'From' and 'to', followed by 'Or Duration between 0 and 60 days' and another input field. Below these fields, there is a button labeled 'Upload dates sample from VOTable'. At the bottom right of the form, there is a 'Submit' button with a help icon. Below the form, there is a table with the following data:

Feature	Instrument	Recognition code	Bibliography	Tracking information
Active Region	SOHO/MDI SOHO/EIT	SMART SPOCA-AR	Higgins et al., 2010 Barra et al., 2009	No Yes
Coronal Hole	SOHO/MDI + SOHO/EIT 195 A SOHO/EIT	CHARM SPOCA-CH	Krista and Gallagher, 2009 Barra et al., 2009	No Yes
Filament	Meudon H Alpha Spectroheliograph	SoSoft & TrackFil	Fuller et al., 2005 - Bonnini et al., 2013	Yes
Prominence	Meudon CAII K3 Spectroheliograph	SoSoPro	N. Fuller	No
Sunspot	SOHO/MDI SDO/HMI	MDISS SDOSS	Zharkov et al., 2005 <a href="http://adsabs.harvard.edu/abs/2005SoPh..228..361Z/">http://adsabs.harvard.edu/abs/2005SoPh..228..361Z/</a>	No
Type III	Wind/Waves, STEREO/Swaves	RABAT3	X. Bonnini	No
Coronal radio emission	Nancay Radio Heliograph	NRH2D	C. Renié, X. Bonnini	Yes



# HELIO

## Heliophysics Feature Catalogue

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The screenshot shows the HELIO Heliophysics Feature Catalogue website. At the top, there is a logo for HELIO Heliophysics. Below the logo, there is a brief description of the catalogue: "The Heliophysics Feature Catalogue (HFC) provides access to existing solar and heliophysics data. The catalogue contains geometrical (e.g., gravity center coordinates, contours, area, etc.) and tracking information to identify co-rotating features on the solar disc." There are two buttons: "Query form" and "Database and fields description".

Below the description, there are three tabs: "1 - Date and time selection", "2 - Features selection", and "3 - Output options". Under the "1 - Date and time selection" tab, there is a form with the following text: "If 'From' and 'to' are empty, date selection is ignored and query applies to the whole data set. From [ ] to [ ] Or Duration between 0 and 60 days [ ]. Or Upload dates sample from VOTable". There is a "Submit" button with a help icon.

On the right side of the interface, there is a vertical list of feature types: "Active Region", "Coronal Hole", "Filament", "Prominence", "Sunspot", "Type III", and "Coronal radio emission".

At the bottom, there is a table titled "The list of the features for which data are currently available in the HFC is given in the following table".

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Active Region	SOHO/MDI SOHO/EIT	SMART SPOCA-AR	Higgins et al., 2010 Barra et al., 2009	No Yes
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# Features...

- $\approx$  15 years of features description
- Obtained from
  - ✦ Meudon/Coimbra spectroheliograms
  - ✦ Nançay radio observations
  - ✦ SOHO and SDO observations
  - ✦ Wind and Stereo
- Extension for filaments (and prominences and faculae) : since 1919 in progress

# Scientific needs

- Context information
- Help for pointing
- Long term behavior
  - ▶ Irradiance
  - ▶ Solar cycleS
  - ▶ Activity (solar features/events)



# Space/ground

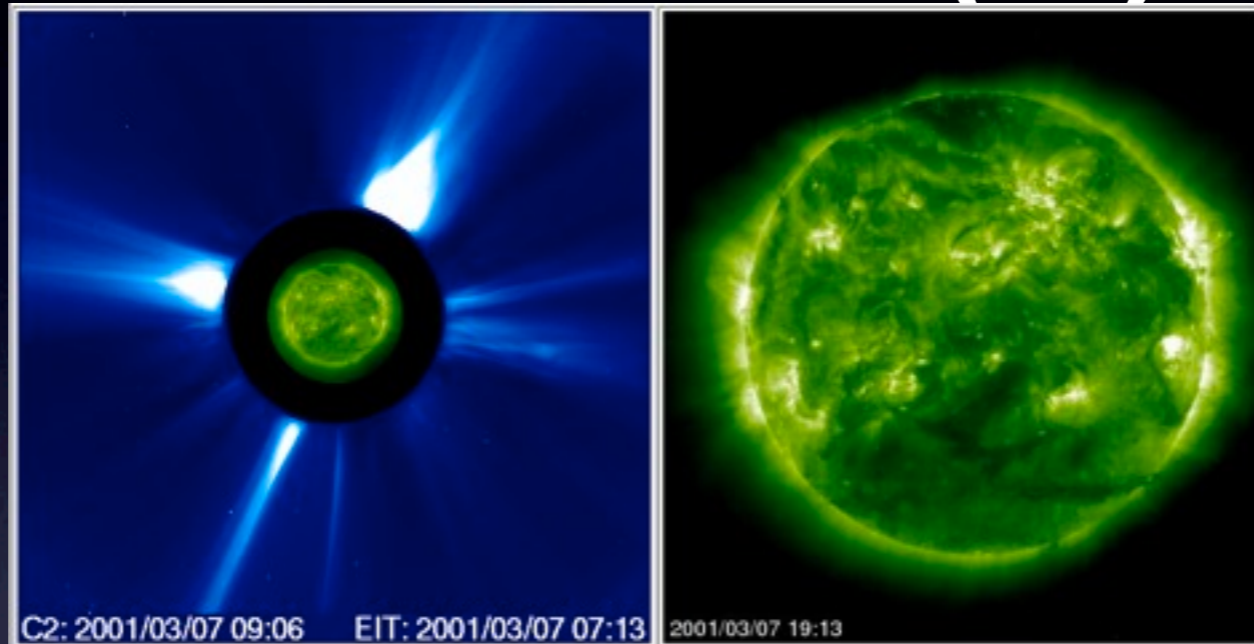
## Space

- No weather issue
- High time resolution
- Degradation of detector
- Limited lifetime
- Very few photosph., chromosph. and high corona observations (no  $H\alpha$ , for instance)

## Ground

- Weather dependant
- Low time resolution
- Easy detector maintenance
- Long lifetime
- No TR and low corona observations, mainly visible (IR) and radio observations

# Back to BASS2000/ HELIO (I)



- Context information and help for pointing:

OK when weather permits!

But only few European observations a day.

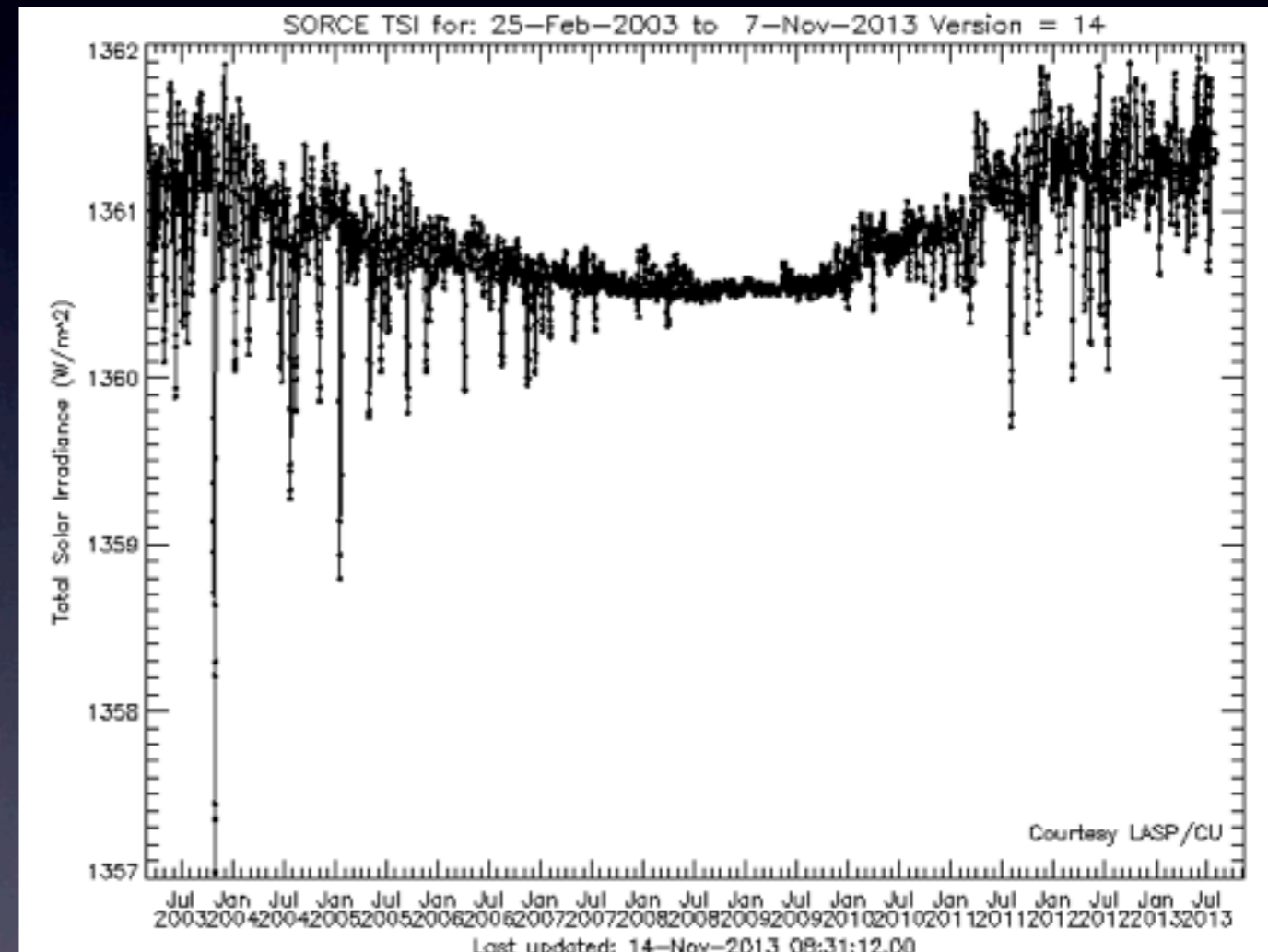
Need for complementary data: possible  
through HELIO; extend it with new data



# Back to BASS2000/ HELIO (II)

- Irradiance, solar cycle and possible connexion with climate:

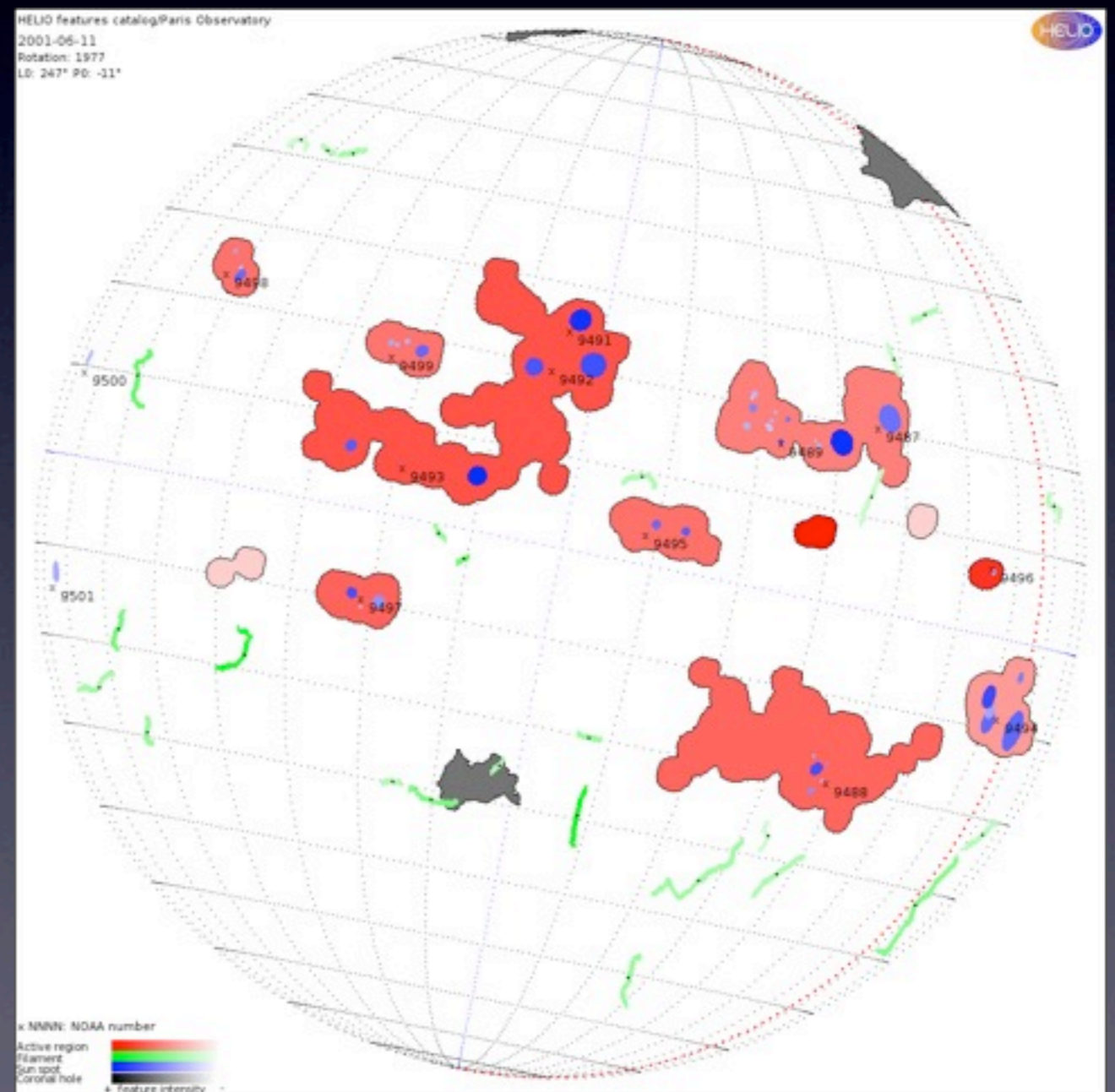
Need for very long term steady observations, possibly from various instruments with strong overlap



Need for as many datasets as possible! i.e. **access**

# Back to BASS2000/ HELIO (III)

- Activity:
  - Propagation
  - Features/events





# Propagation

- Models available in:

HELIO

CDPP

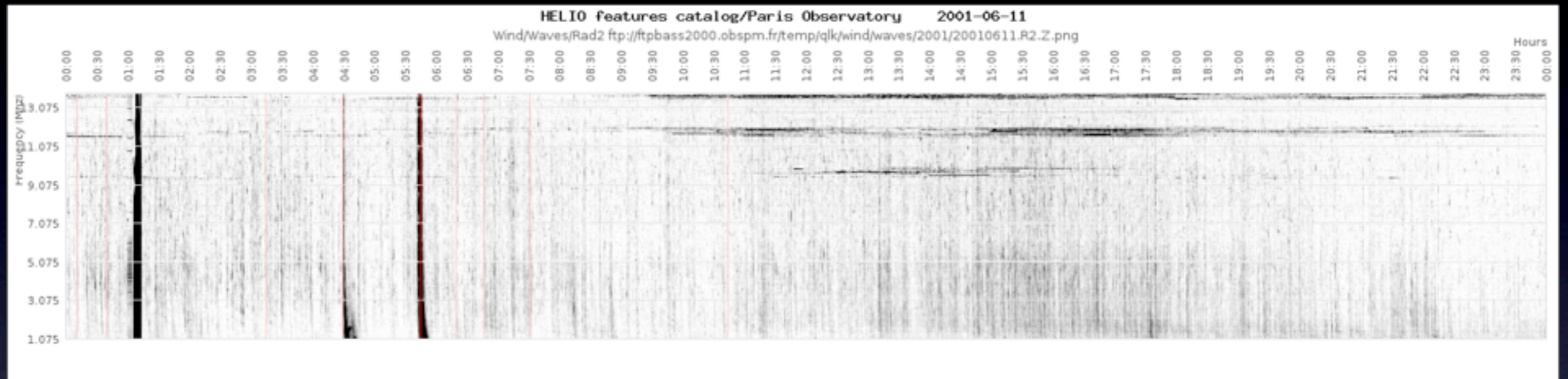
NASA/CCMC

...



Need events catalogues to improve models  
(already  $\approx 70$  in HELIO, but lack of Earth events)

# Features/events



- Events catalogues scattered, but single access via HELIO
- Very few features catalogues except HELIO/HFC

Need to enrich events and features catalogues over new kinds of activities AND over longer periods of time



# So we need:

- Data organization and access [databases]
- Standard description of data [CASSIS project]
- Single access to several datasets (obs/catalogues) [HELIO]
- Reliable long term homogeneous observations [HELIO/HFC and BASS2000]

# So we need:

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In order to be able to connect and understand phenomena propagating for the Sun to the Earth (and beyond)