FP7 Project – HELCATS – WPs 5, 6 and 8

Alexis P Rouillard[1], Benoit Lavraud[1], Vincent Génot[1], Jackie Davies[3], Frédéric Baudin[4], Myriam Bouchemit[1], Manu Penou[1], Emilia Kilpua[6], Dusan Odstrcil[7]

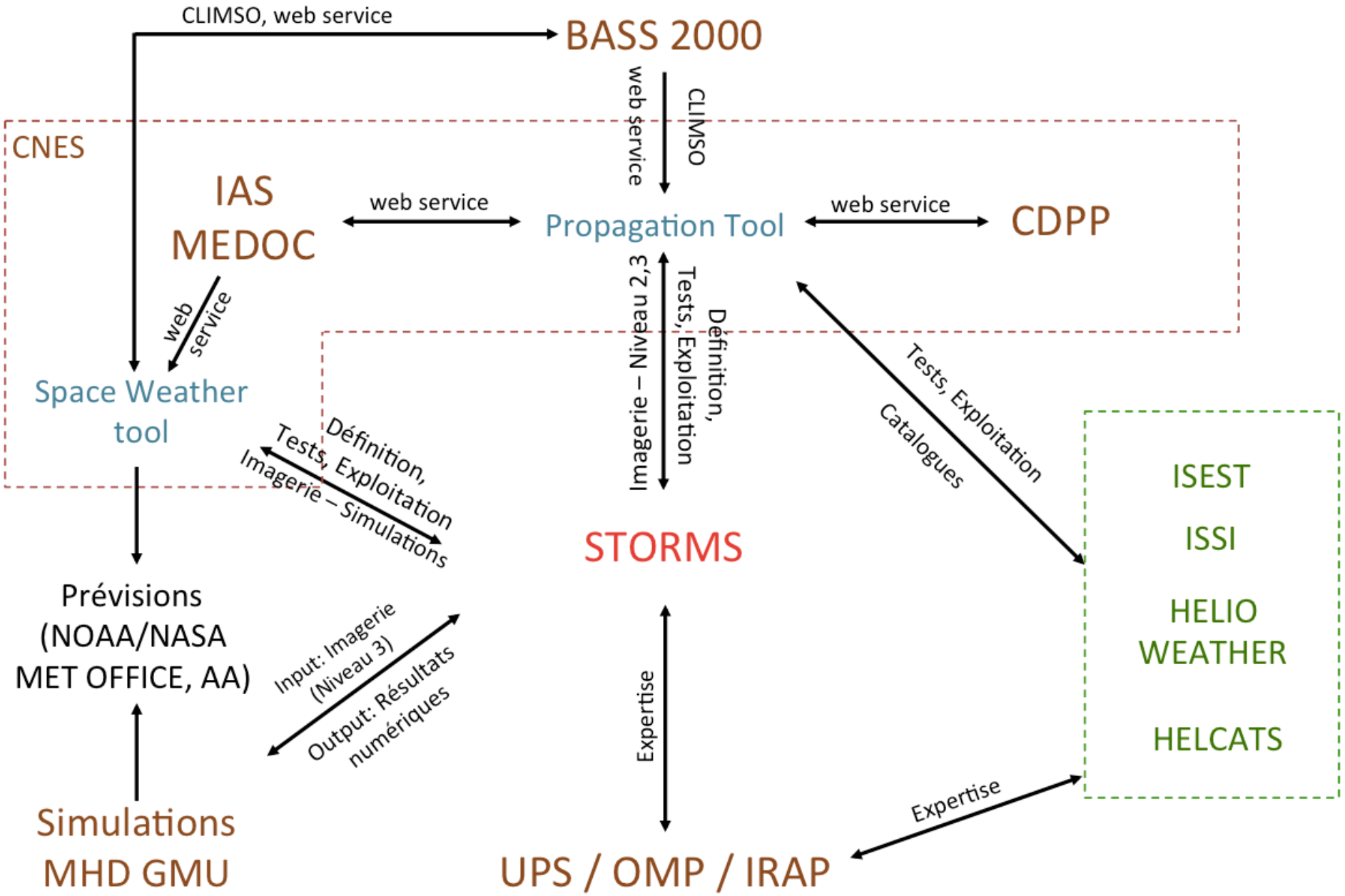
(1) IRAP-CNRS / UPS, (2) CNES, (3) STFC, (4) IAS, (6) University of Helsinki, (7) George Mason University

T8- Dissemination of catalogues

- D8.7 : Create a web-service between UKSSDC and the already existing IRAP propagation tool. This tool will provide access to the CME/CIR catalogues (from WP3 and WP5) and will offer an additional platform to help scientists access and manipulate catalogues developed in this project. Integrate the newly calibrated HI J-maps to the propagation tool. Including access to pre-generated time-elongation profiles for specific CMEs/CIRs or permitting users to extract profiles by clicking on J-maps. [month 36]

- D8.8 : Store the most accurate Carrington maps of solar wind speed at UKSSDC and integrate these maps in the IRAP propagation tool. Upon completion of the IRAP propagation tool, the interface will offer direct visualization of Carrington maps; integrating the Carrington maps calibrated in this proposal will be straightforward. [month 36]

THE FRENCH SCENE



CDPP -STORMS

CDPP: French data center for in situ plasma data: CNES funded
Scientific director: Vincent Génot

CDPP Tools:

AMDA:

- provides access to the CDPP data
- web-based data-mining tool (calculations, superposed epoch analysis, etc…)
- provides access to catalogues (e.g. CMEs (Wind/ACE))

3-D view:

- Orbital visualisation tool

TREPS:

- Coordinate transformation tool (e.g. transform GSE data into GSM data)

STORMS: Solar-Terrestrial ObseRvations and Modeling Service
Space-Weather Service recognised as a national service by CNRS (INSU)
Leader: Alexis Rouillard

CDPP/STORMS tools: CNES funded

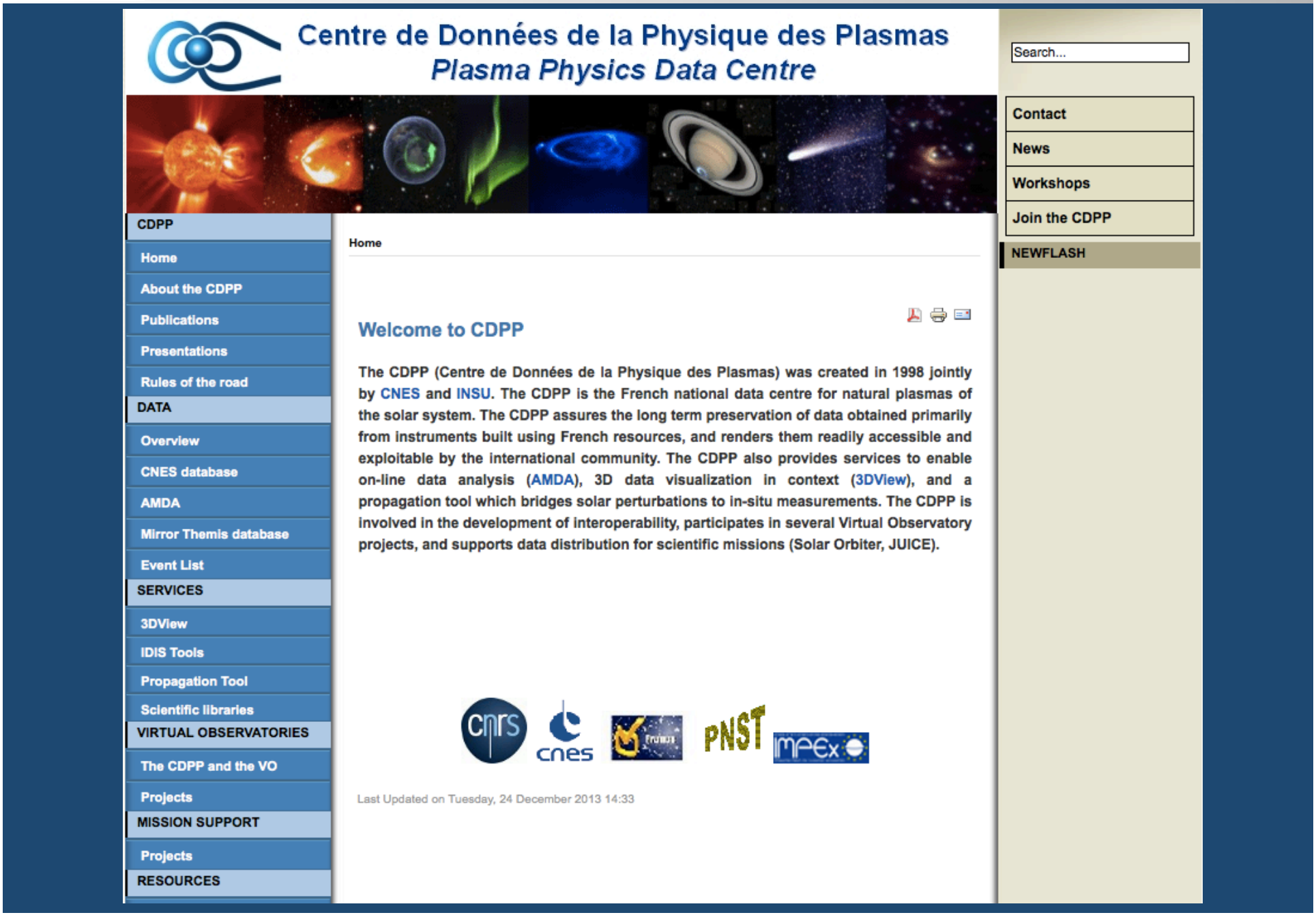
Propagation Tool:

- idea formulated by IRAP for the HELIO project (deliverable), developped David Perez-Suarez
- CDPP propagation tool was funded by CNES, tool developped around exploiting HI J-maps

Space Weather Tool:

- Tool developped around Kunkel-Chen theory of CME eruption and propagation (magnetically-driven acceleration).

CDPP -STORMS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Plasma Physics Data Centre
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The CDPP and the VO
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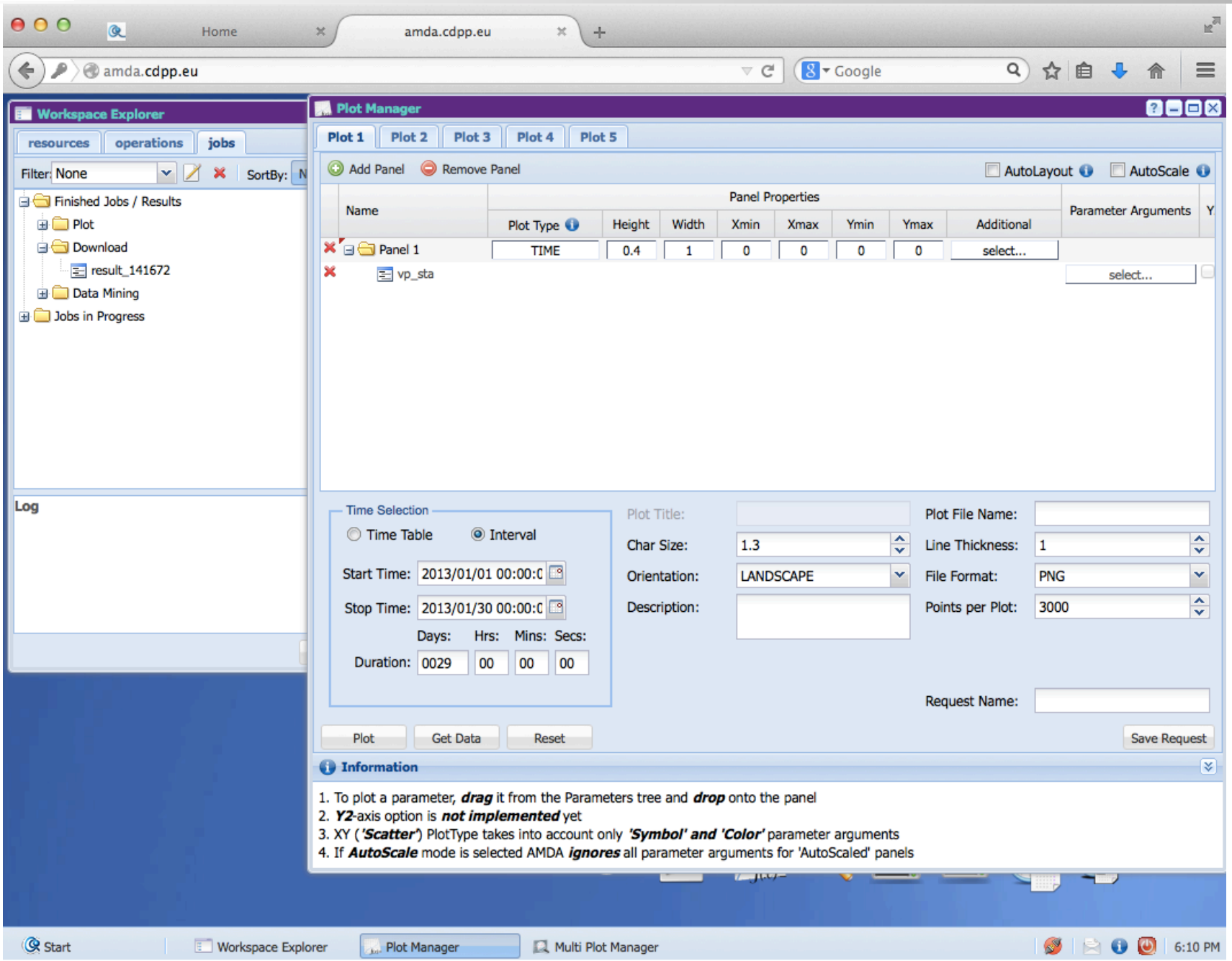
Welcome to CDPP
The CDPP (Centre de Données de la Physique des Plasmas) was created in 1998 jointly by CNES and INSU. The CDPP is the French national data centre for natural plasmas of the solar system. The CDPP assures the long term preservation of data obtained primarily from instruments built using French resources, and renders them readily accessible and exploitable by the international community. The CDPP also provides services to enable on-line data analysis (AMDA), 3D data visualization in context (3DView), and a propagation tool which bridges solar perturbations to in-situ measurements. The CDPP is involved in the development of interoperability, participates in several Virtual Observatory projects, and supports data distribution for scientific missions (Solar Orbiter, JUICE).
cnrs
cnes
PNST
Last Updated on Tuesday, 24 December 2013 14:33

AMDA

>>> Elena.Budnik@irap.omp.eu

AMDA


Home
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Workspace Explorer
resources
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jobs
Filter: None
SortBy:
Finished Jobs / Results
Plot
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result_141672
Data Mining
Jobs in Progress
Log
Plot Manager
Plot 1
Plot 2
Plot 3
Plot 4
Plot 5
Add Panel
Remove Panel
AutoLayout
AutoScale
Name
Panel Properties
Plot Type
Height
Width
Xmin
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Additional
Parameter Arguments
Panel 1
TIME
0.4
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Time Selection
Time Table
Interval
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Stop Time: 2013/01/30 00:00:0
Days: Hrs: Mins: Secs:
Duration: 0029 00 00 00
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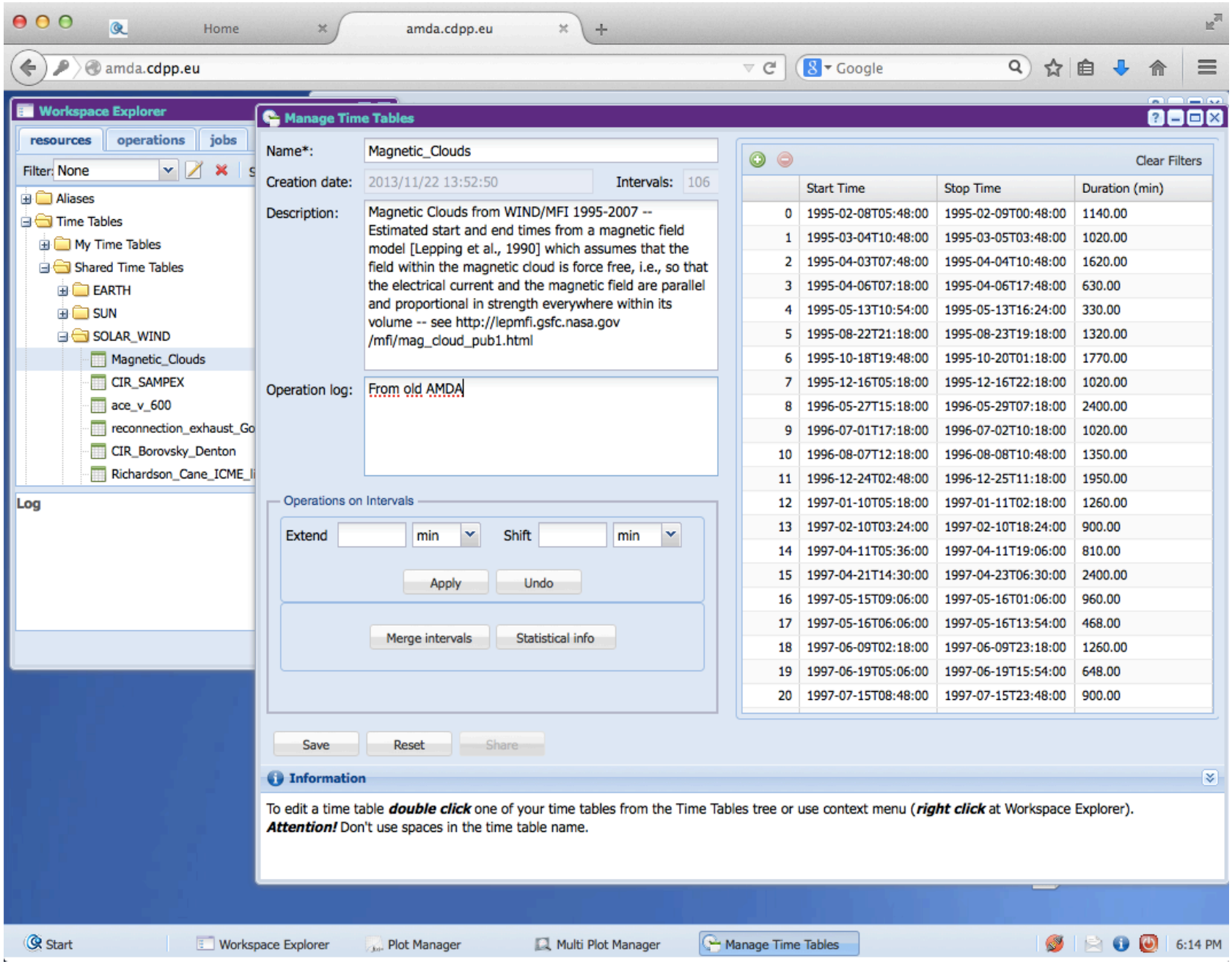
Char Size: 1.3
Orientation: LANDSCAPE
Description:
Plot File Name:
Line Thickness: 1
File Format: PNG
Points per Plot: 3000
Request Name:
Plot
Get Data
Reset
Save Request
Information
1. To plot a parameter, drag it from the Parameters tree and drop onto the panel
2. Y2-axis option is not implemented yet
3. XY ('Scatter') PlotType takes into account only 'Symbol' and 'Color' parameter arguments
4. If AutoScale mode is selected AMDA ignores all parameter arguments for 'AutoScaled' panels
Start
Workspace Explorer
Plot Manager
Multi Plot Manager
6:10 PM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resources
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jobs
Filter: None
Aliases
Time Tables
My Time Tables
Shared Time Tables
EARTH
SUN
SOLAR_WIND
Magnetic_Clouds
CIR_SAMPEX
ace_v_600
reconnection_exhaust_Go
CIR_Borovsky_Denton
Richardson_Cane_ICME_li
Log
Manage Time Tables
Name*: Magnetic_Clouds
Creation date: 2013/11/22 13:52:50
Intervals: 106
Description: Magnetic Clouds from WIND/MFI 1995-2007 -- Estimated start and end times from a magnetic field model [Lepping et al., 1990] which assumes that the field within the magnetic cloud is force free, i.e., so that the electrical current and the magnetic field are parallel and proportional in strength everywhere within its volume -- see http://lepmfi.gsfc.nasa.gov /mfi/mag_cloud_pub1.html
Operation log: From old AMDA
Operations on Intervals
Extend
min
Shift
min
Apply
Undo
Merge intervals
Statistical info
Save
Reset
Share
Clear Filters
Start Time
Stop Time
Duration (min)
0 1995-02-08T05:48:00 1995-02-09T00:48:00 1140.00
1 1995-03-04T10:48:00 1995-03-05T03:48:00 1020.00
2 1995-04-03T07:48:00 1995-04-04T10:48:00 1620.00
3 1995-04-06T07:18:00 1995-04-06T17:48:00 630.00
4 1995-05-13T10:54:00 1995-05-13T16:24:00 330.00
5 1995-08-22T21:18:00 1995-08-23T19:18:00 1320.00
6 1995-10-18T19:48:00 1995-10-20T01:18:00 1770.00
7 1995-12-16T05:18:00 1995-12-16T22:18:00 1020.00
8 1996-05-27T15:18:00 1996-05-29T07:18:00 2400.00
9 1996-07-01T17:18:00 1996-07-02T10:18:00 1020.00
10 1996-08-07T12:18:00 1996-08-08T10:48:00 1350.00
11 1996-12-24T02:48:00 1996-12-25T11:18:00 1950.00
12 1997-01-10T05:18:00 1997-01-11T02:18:00 1260.00
13 1997-02-10T03:24:00 1997-02-10T18:24:00 900.00
14 1997-04-11T05:36:00 1997-04-11T19:06:00 810.00
15 1997-04-21T14:30:00 1997-04-23T06:30:00 2400.00
16 1997-05-15T09:06:00 1997-05-16T01:06:00 960.00
17 1997-05-16T06:06:00 1997-05-16T13:54:00 468.00
18 1997-06-09T02:18:00 1997-06-09T23:18:00 1260.00
19 1997-06-19T05:06:00 1997-06-19T15:54:00 648.00
20 1997-07-15T08:48:00 1997-07-15T23:48:00 900.00
Information
To edit a time table double click one of your time tables from the Time Tables tree or use context menu (right click at Workspace Explorer).
Attention! Don't use spaces in the time table name.
Start
Workspace Explorer
Plot Manager
Multi Plot Manager
Manage Time Tables
6:14 PM

PROPAGATION TOOL

Welcome to CDPP/Propagation Tool

Tutorials : video (mov files)

- Introduction to the CDPP Propagation Tool (13M)
- Description of the propagation tool main interface (8M)
- Case 1: Using the tool in the Jmap Carrington/In situ mode (radial) (37M)
- Case 2: Using the tool in the Jmap tool click mode (radial) (39M)

Tutorials : video (mpeg files)

- Introduction to the CDPP Propagation Tool (46M)
- Description of the propagation tool main interface (47M)
- Case 1: Using the tool in the Jmap Carrington/In situ mode (radial) (176M)
- Case 2: Using the tool in the Jmap tool click mode (radial) (184M)

Table of available data

- Flare Data, Carrington Maps, J-Maps, Solar Wind Speed

Supported set up

- Check browser/OS support
- Java requirements
- Get java 7.45
- Linux troubleshoot

What's new ?

- New J-maps will be available in February 2014

Launch the Propagation Tool

A new interactive tool accessible to the solar, heliospheric and planetary science communities to track solar storms, streams and energetic particles in the heliosphere

The propagation tool allows users:

- to propagate solar eruptions (CMEs) radially sunward or anti-sunward (**Radial Propagation**),
- to propagate corotating structures (CIRs) in the heliosphere (**Corotation**),
- to propagate solar energetic particles along magnetic fields lines sunward or anti-sunward (**SEP Propagation**),

The START and END points (defined by a right click on the ecliptic plane) can be the Sun, planets or probes situated in the interplanetary medium. The times of propagation between the START and END points are based on simple analytic calculations.

The added values of the tool are an easy access to unique datasets and a fast interoperability :

- it integrates the **orbital elements** (using SPICE) of probes and planets. This allows you to determine via simple clicks the position/orientations of imagers that you would like to consider,
- it offers **web-service** access to summary plots of in-situ data stored at the CDPP as well as movies of solar images stored at MEDOC,
- it provides access to a wide range of **Carrington maps** of the solar surface to visualize the location of active regions, coronal holes and solar flares on the Sun

The great novelty of the tool is the immediate visualisation and basic manipulation of maps of solar wind mass flows tracked continuously from the Sun to 1AU. These maps are called J-maps and are generated by extracting bands of pixels in coronal and heliospheric images along the ecliptic planes and stacking them vertically (along the ordinate) with time (along the abscissae). The maps are produced from teraoctets of imagery data that are impossible to manipulate if you are not an expert in the field. The tool was designed to be user friendly and accessible to any scientist interested in locating CMEs/CIRs and particle fluxes in the ecliptic plane.

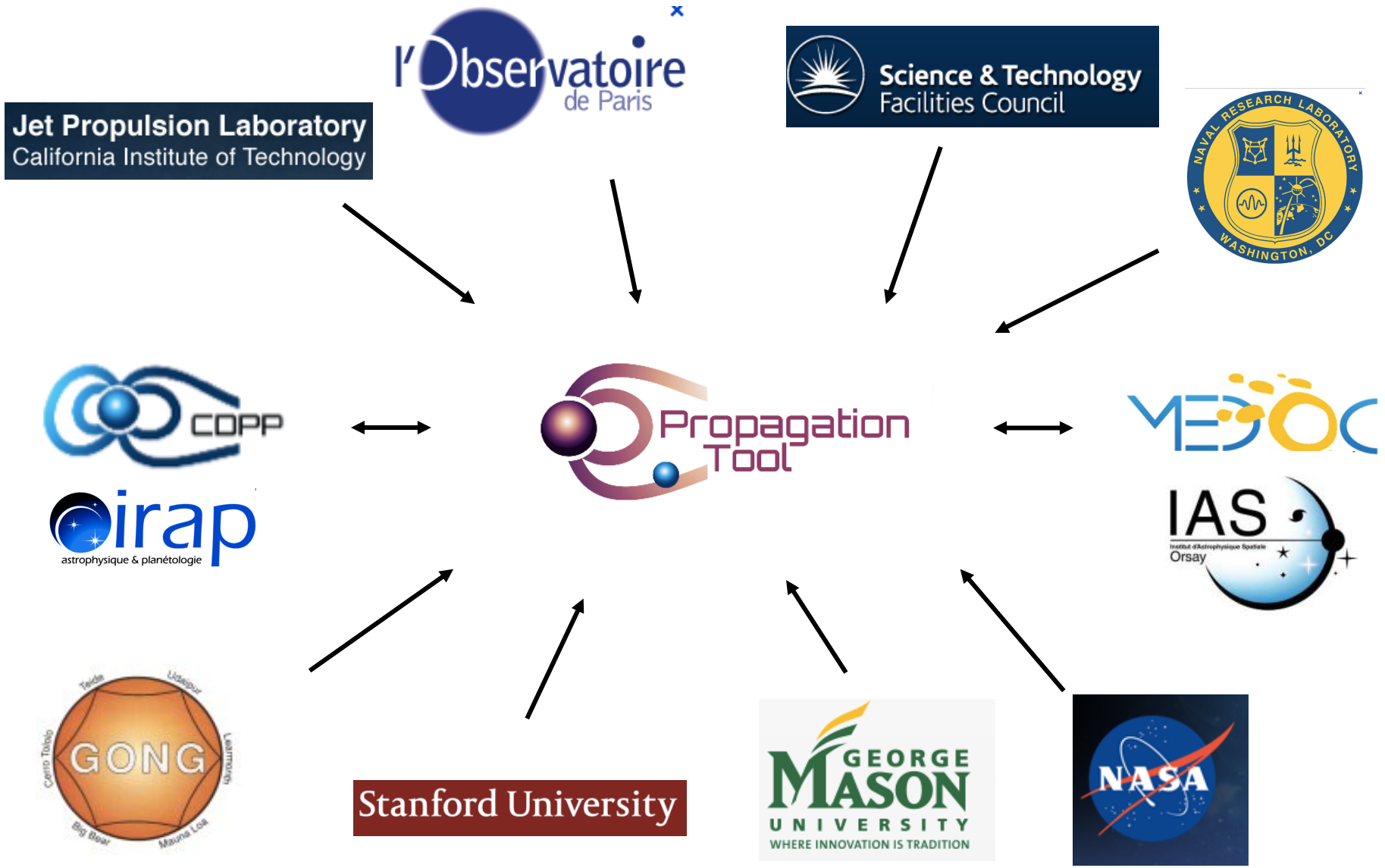
With the tool you can use these maps to:

- cross check your ballistic calculation of CME/CIR propagations,
- carry out your own calculations of CME/CIR trajectories in the ecliptic plane via a few clicks on the map (simple use),
- use pre-calculated CME trajectories to check if a transient emerged from the Sun and impacted a planet or probe

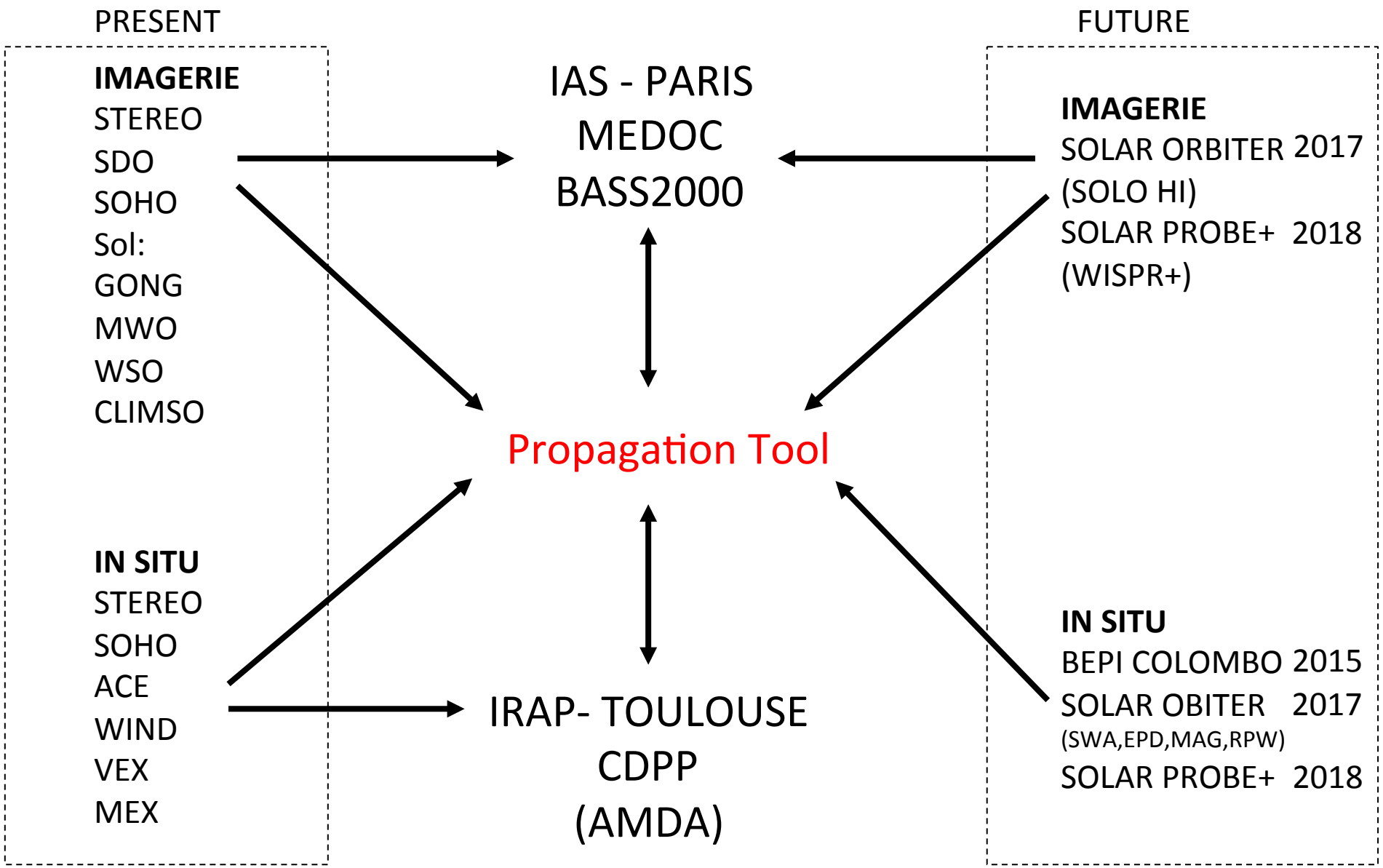
MISSION	INSTRUMENT	START DATE	END DATE	START CAR. ROT.	END CAR. ROT.
FLARES					
NOAA REPORTS	GOES	1996-07-31 08:29:00	2014-04-09 23:43:00	1912	2149
CARRINGTON MAPS					
SOHO	EIT 195Å	1996-01-17 01:25:14	2013-11-21 17:38:24	1905	2144
	EIT 304Å	1996-01-17 01:25:14	2013-11-21 17:38:24	1905	2144
	MDI	1996-05-05 06:48:31	2010-11-26 17:34:04	1909	2104
STEREO-A	EUVI 195Å	2006-12-12 04:03:47	2013-12-19 01:17:54	2051	2145
	EUVI 304Å	2006-12-12 04:03:47	2013-12-19 01:17:54	2051	2145
STEREO-B	EUVI 195Å	2006-12-12 04:03:47	2013-12-19 01:17:54	2051	2145
	EUVI 304Å	2006-12-12 04:03:47	2013-12-19 01:17:54	2051	2145
SDO	MAG	2010-04-22 18:25:37	2014-02-11 17:29:19	2096	2147
JMAPS					
STEREO-A	HI-1 HI-2	2007-04-01 00:00:00	2014-02-03 00:00:00	2055	2146
STEREO-B	HI-1 HI-2	2007-04-01 00:00:00	2014-02-03 00:00:00	2055	2146
VPLOT					
STEREO-A	PLASTIC	2007-02-14 00:00:37	2013-09-30 23:50:19	2053	2142
STEREO-B	PLASTIC	2007-03-01 00:00:42	2013-09-30 23:50:14	2053	2142
ACE	SWEPAM	1998-02-05 00:01:35	2014-01-09 20:10:12	1932	2145
WIND	SWE	1998-01-01 00:03:45	2014-04-08 23:57:51	1931	2149
OMNI	SWEPAM/SWE	1998-01-01 00:00:00	2014-03-03 01:05:00	1931	2147

PROPAGATION TOOL

The tool retrieves data from several data centers and data repositories:



PROPAGATION TOOL



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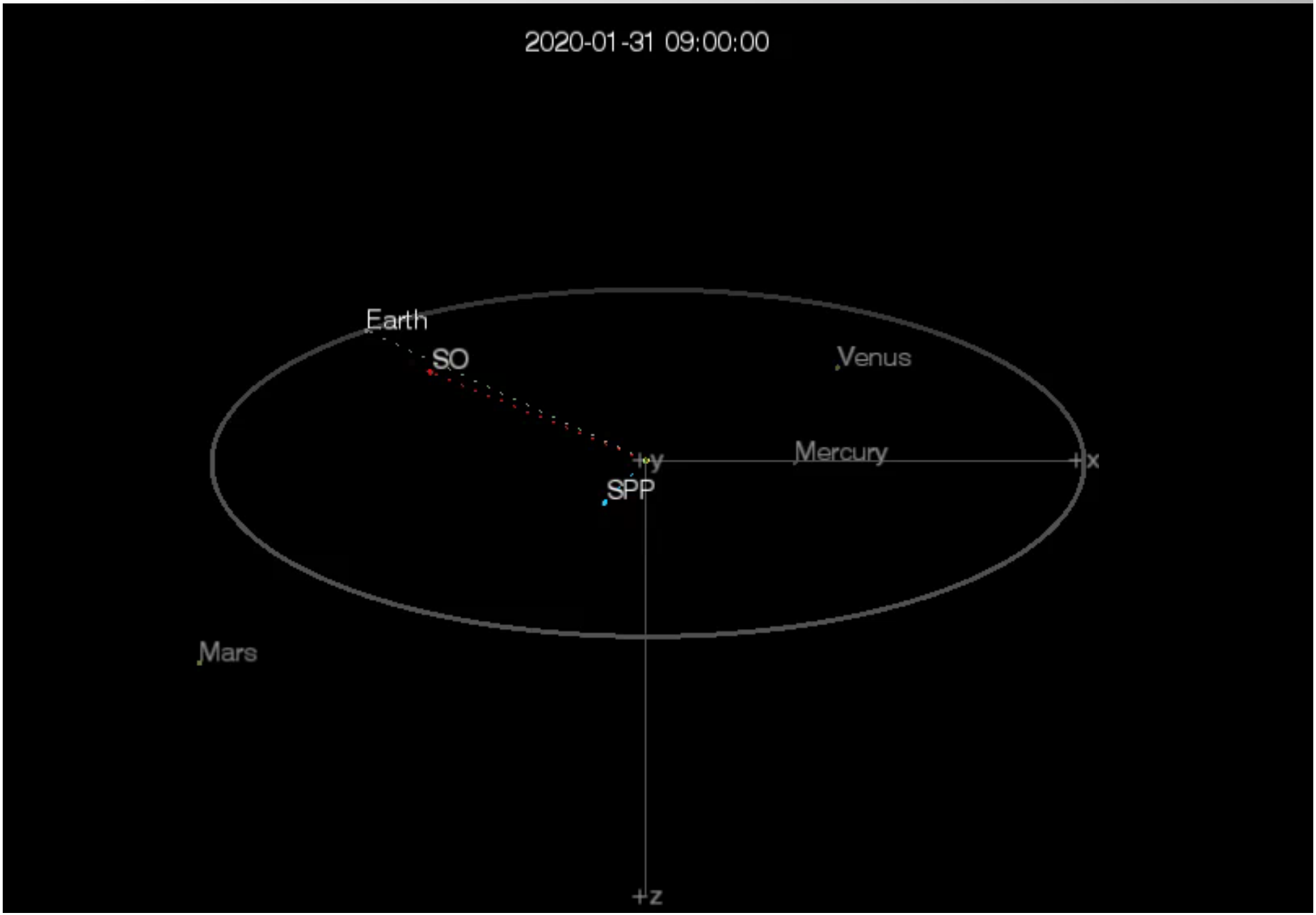

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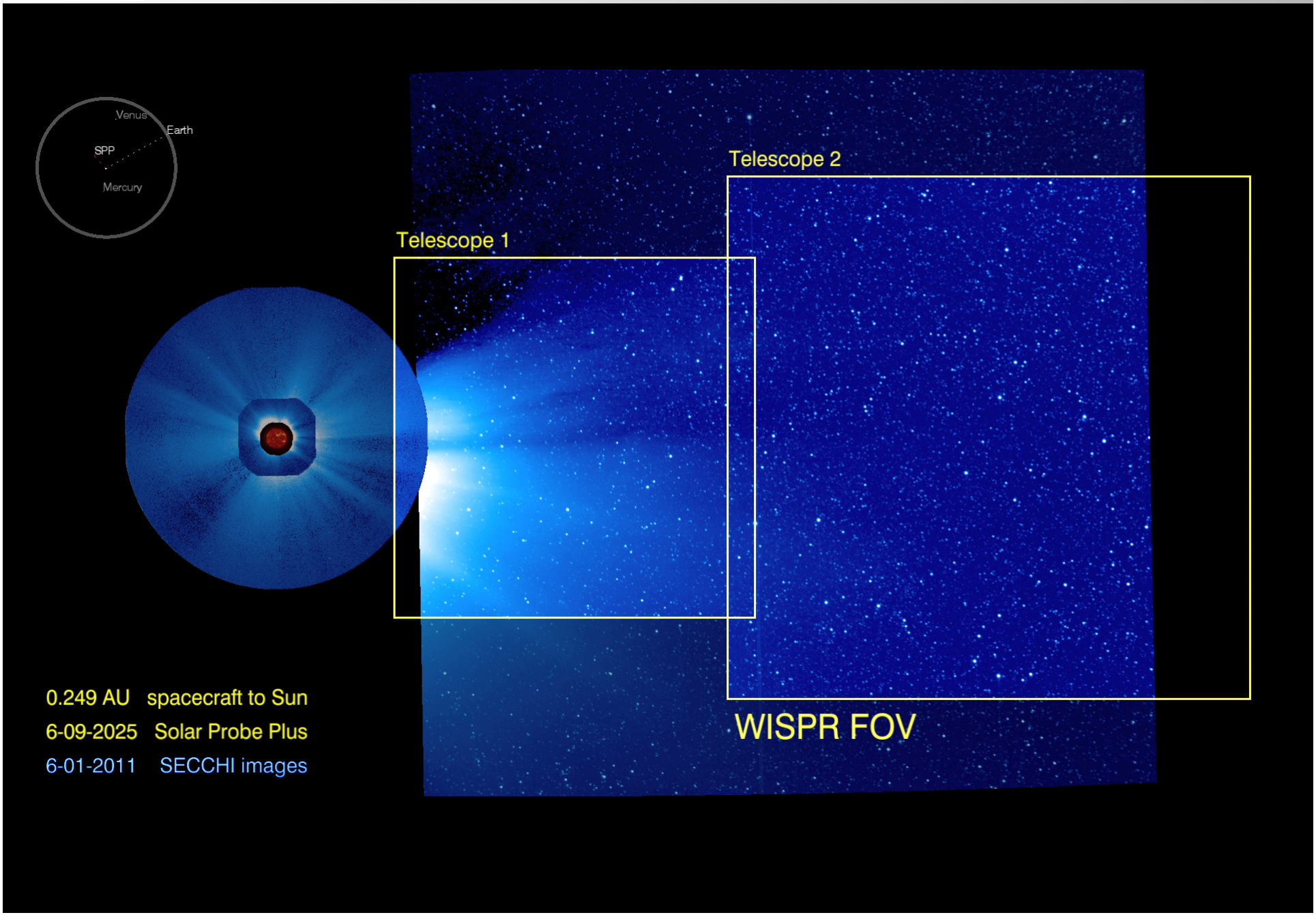
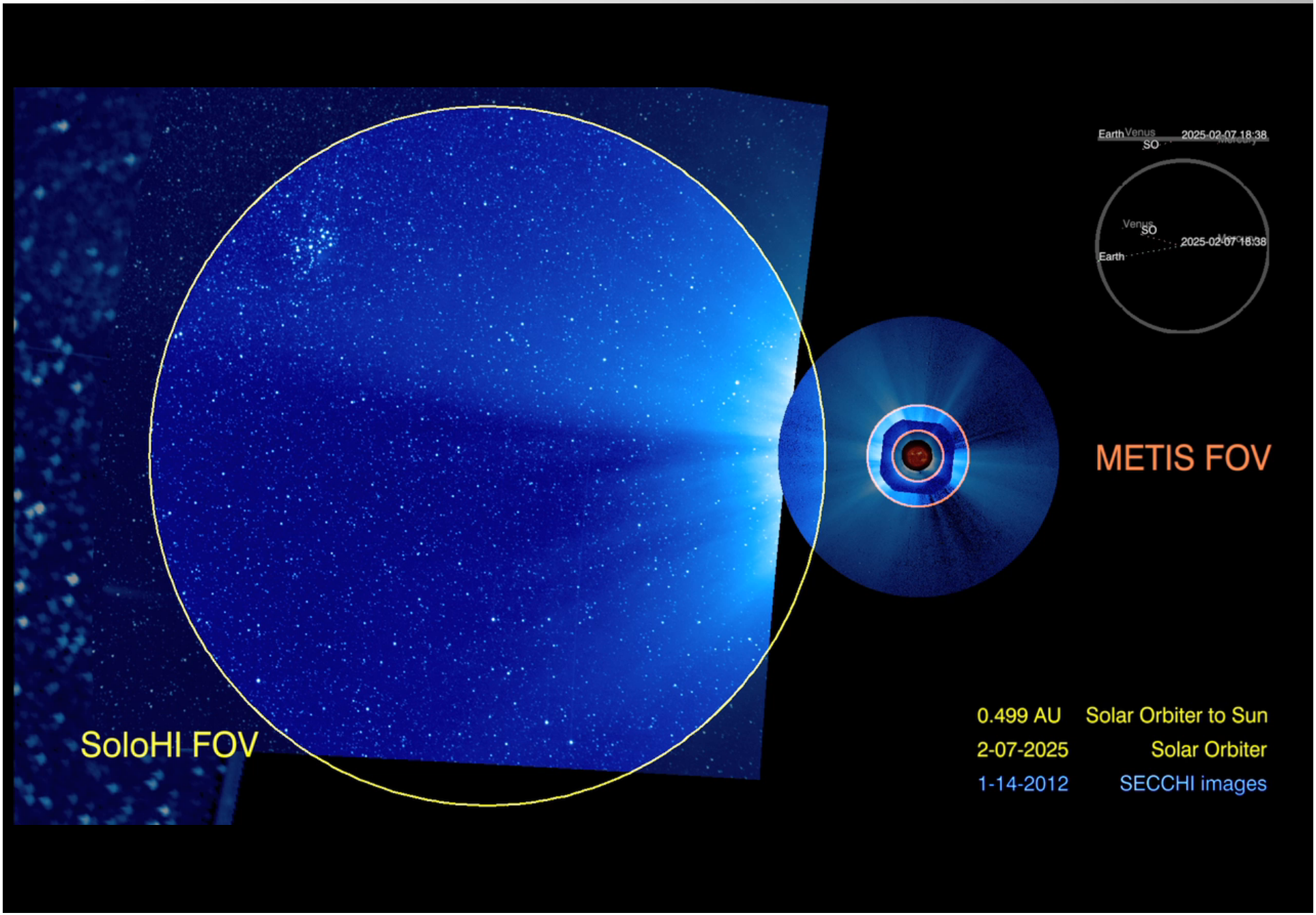
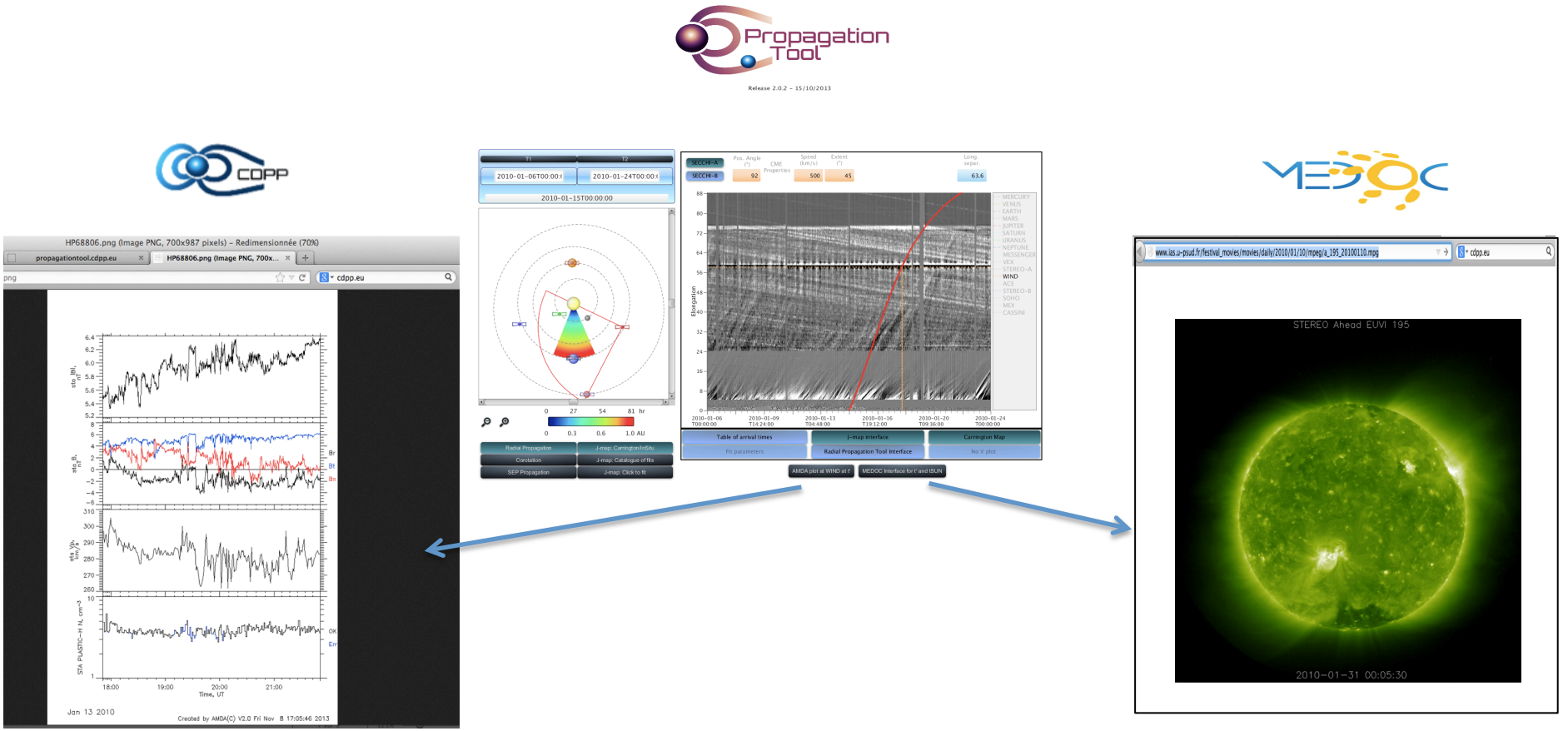


PROPAGATION TOOL



The link to the French plasma (CDPP) and solar image (MEDOC) data centers is via web-service:

- In situ datasets are accessed in a fixed format via AMDA (CDPP data mining tool),
- Solar (daily) movies are launched in your browser via the MEDOC data center



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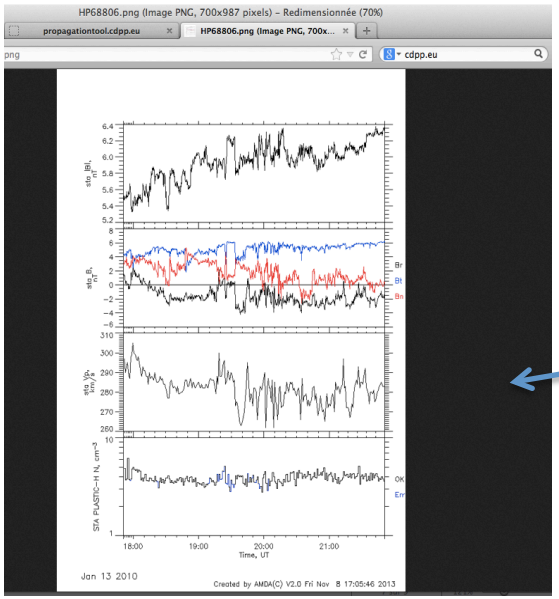
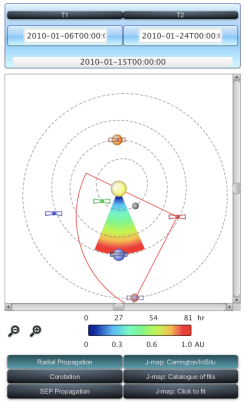
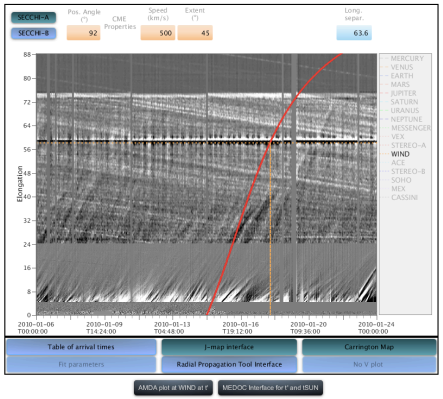
Propagation Tool

Release 2.0.2 – 15/10/2013

CDPP

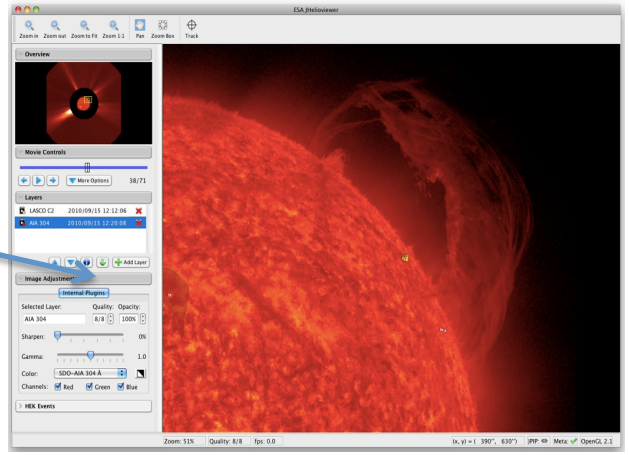






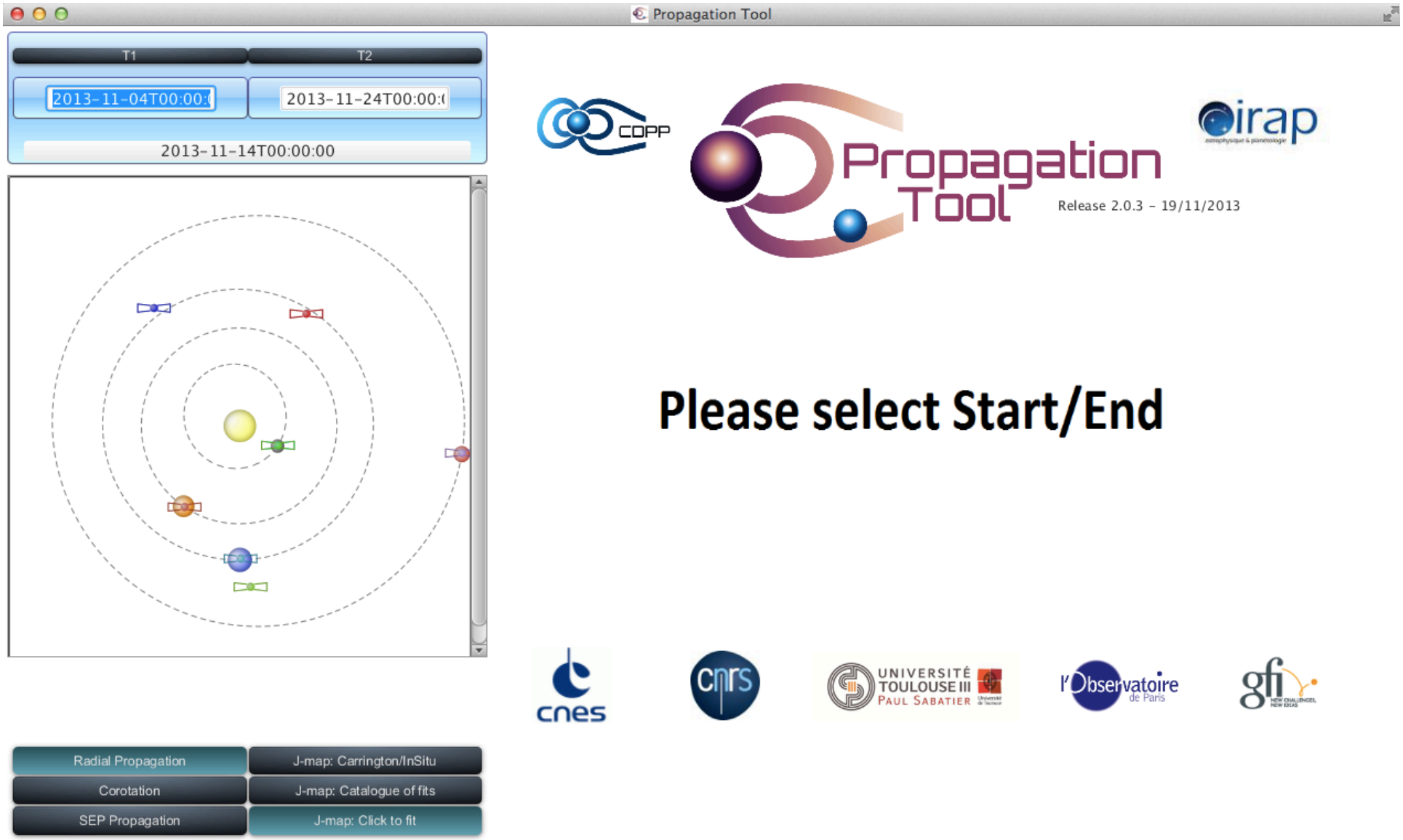
MEDOC

JHelioviewer



PROPAGATION TOOL

PROPAGATION TOOL



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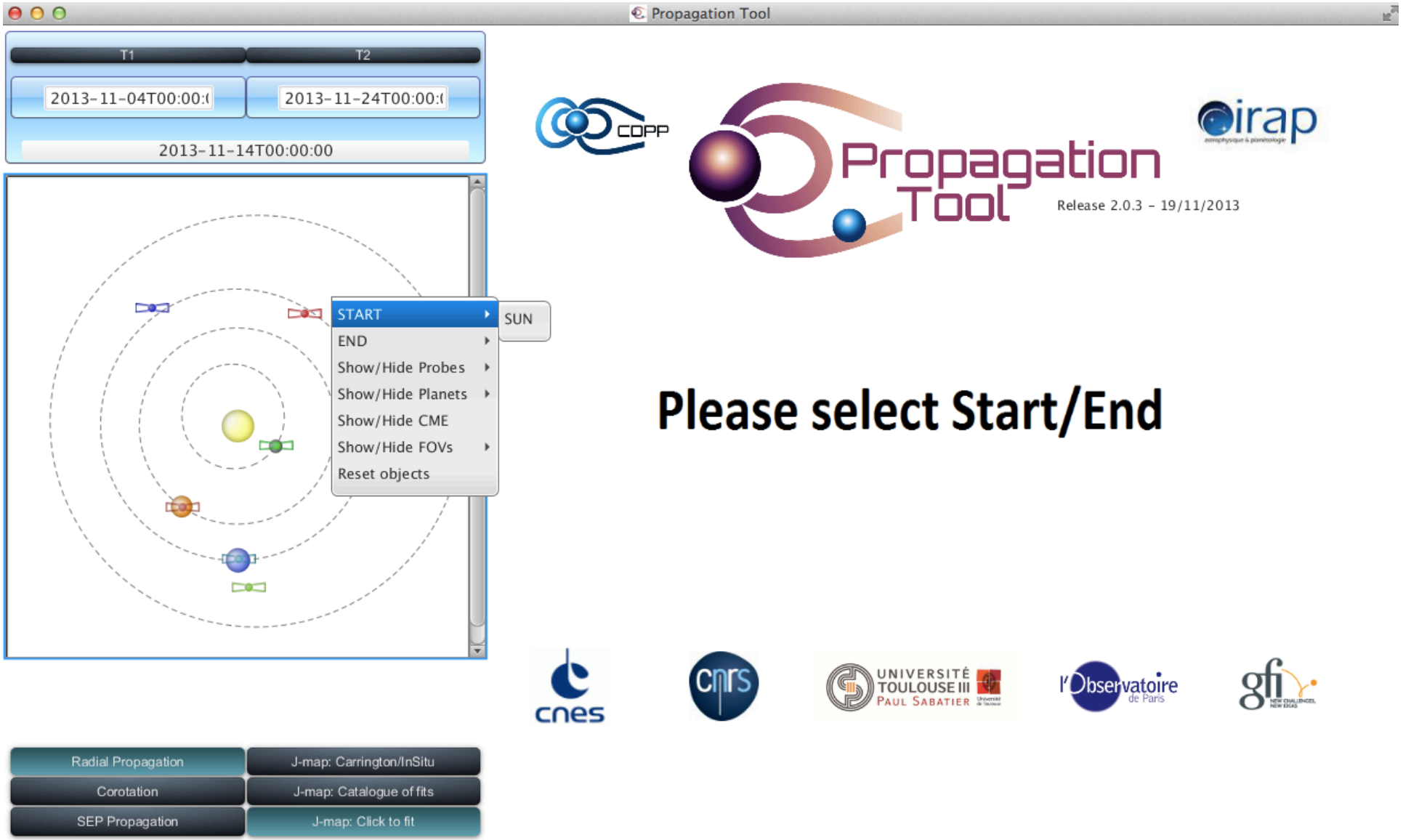

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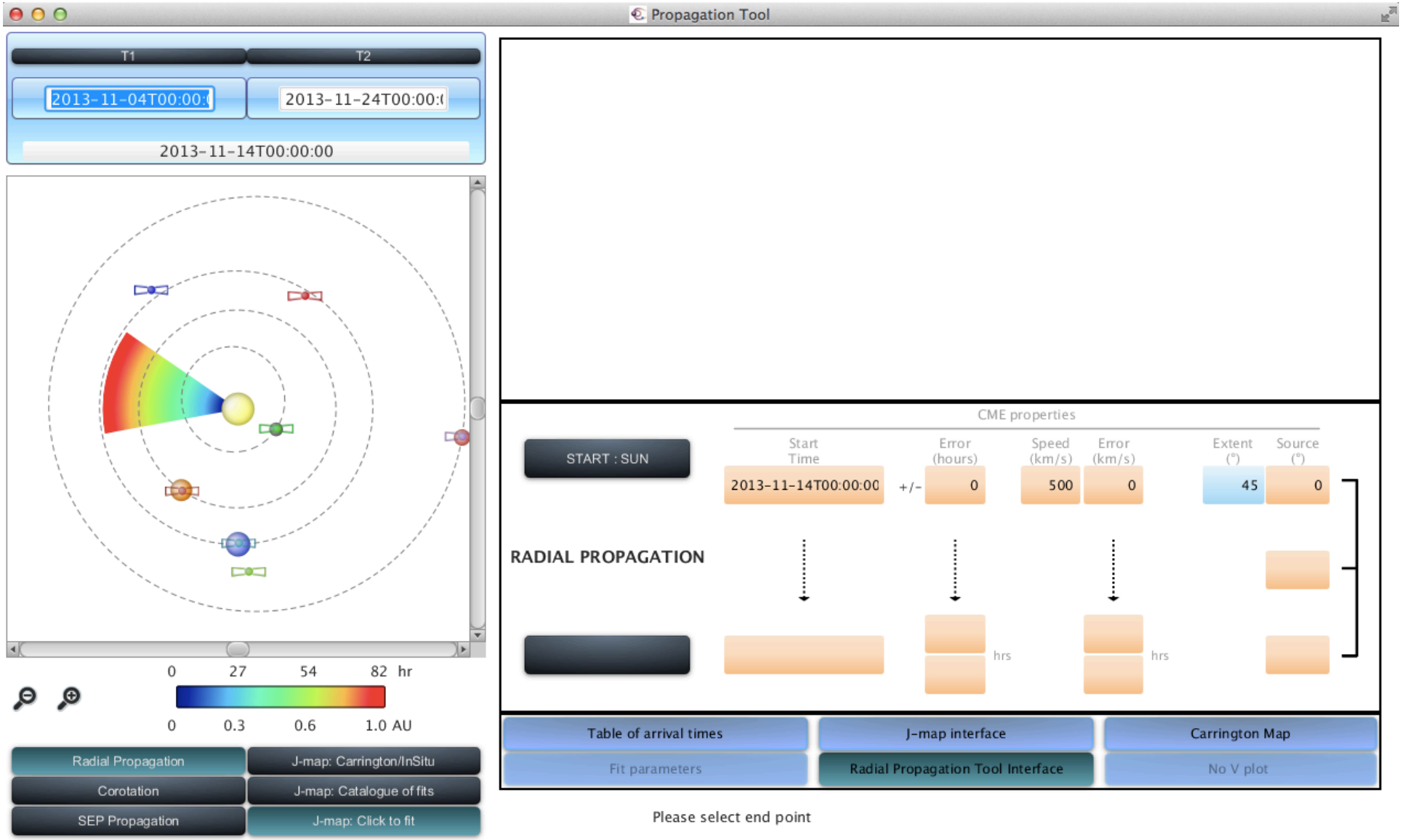

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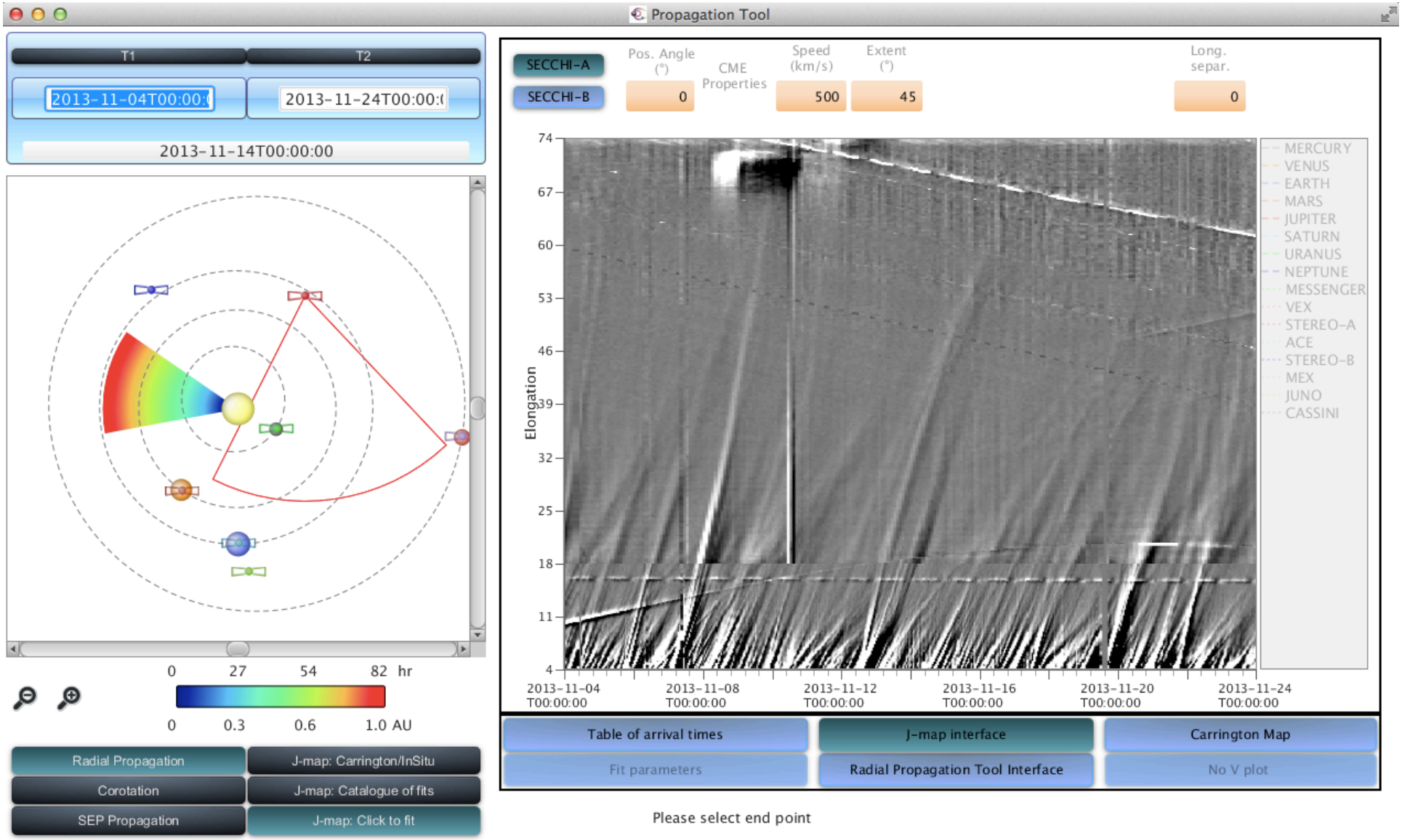

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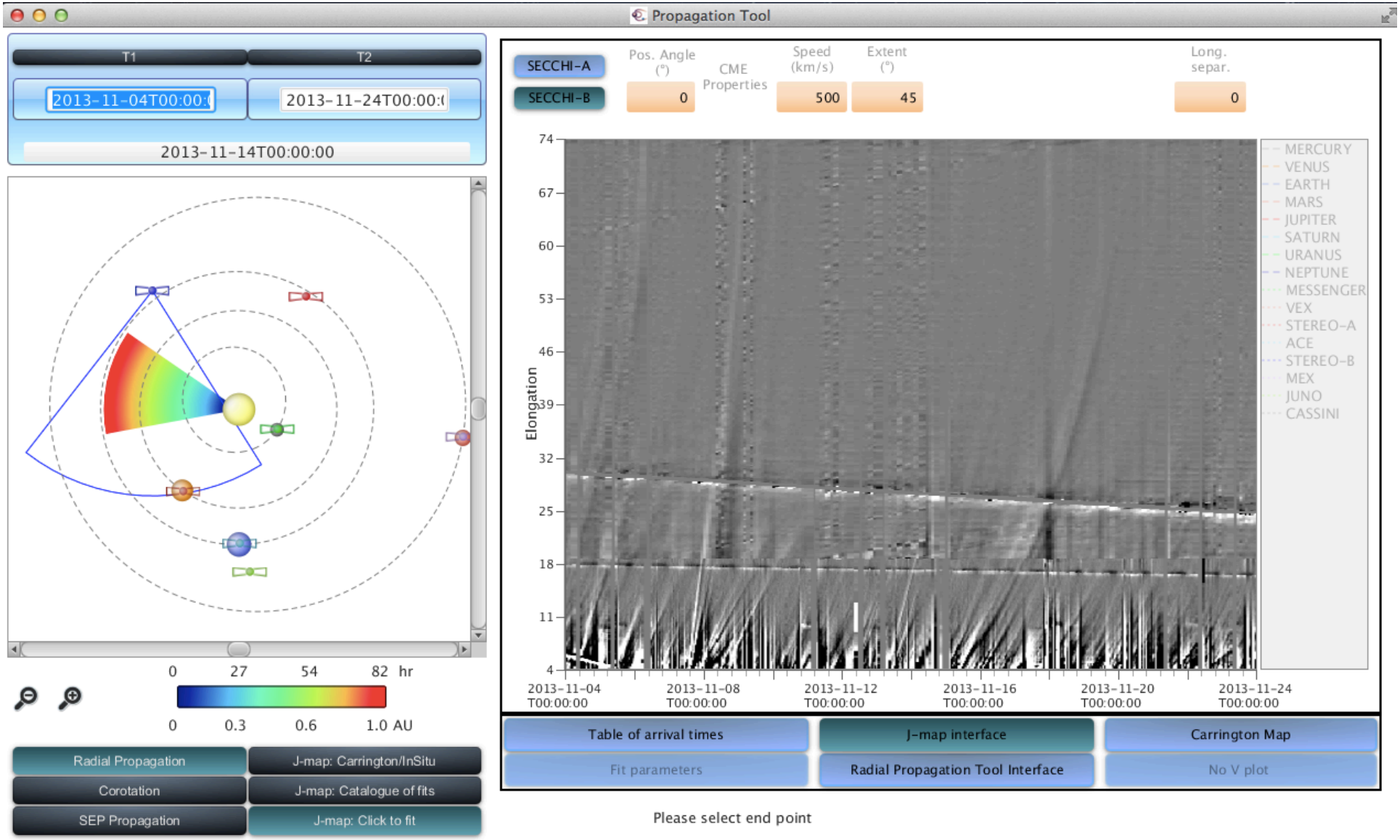

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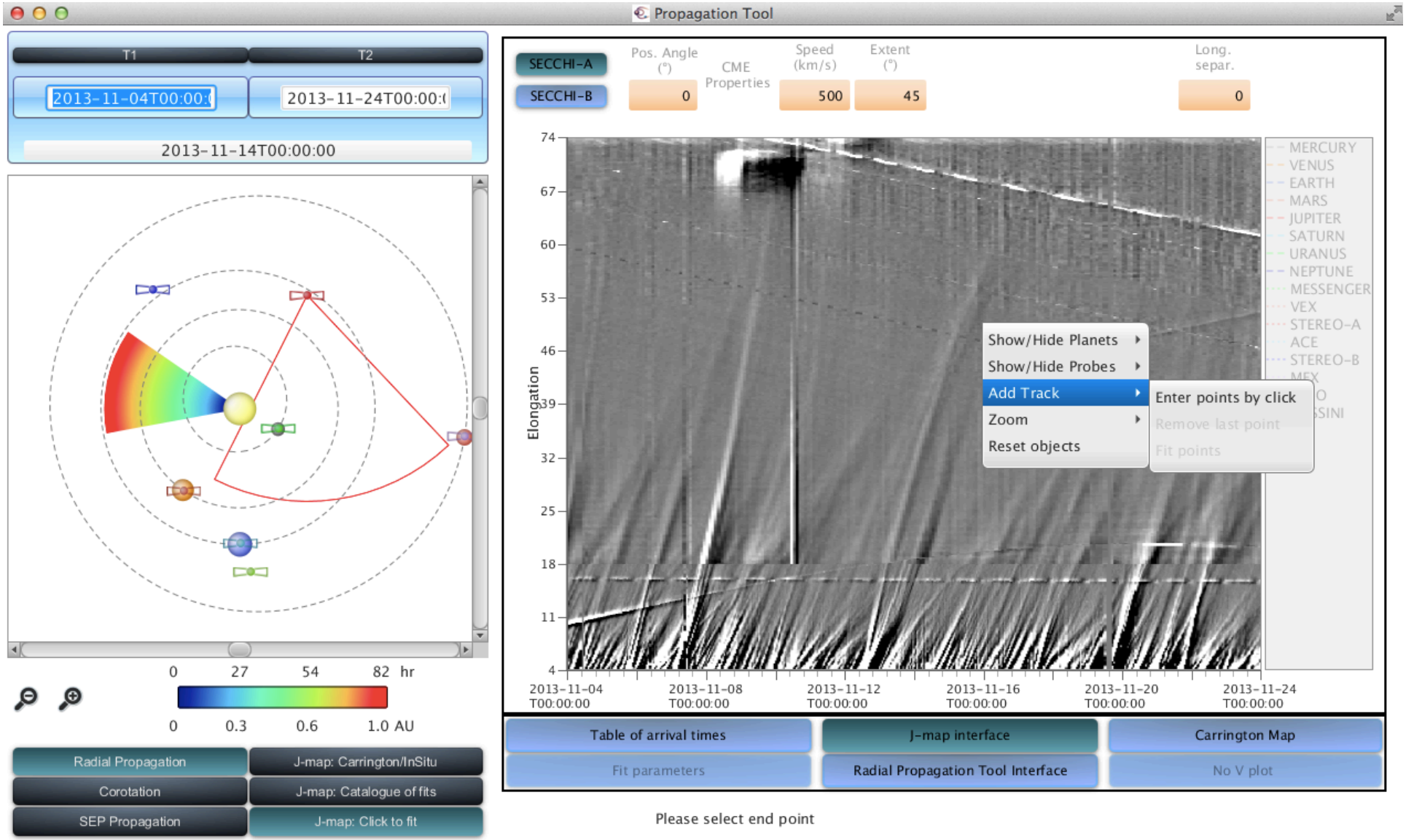

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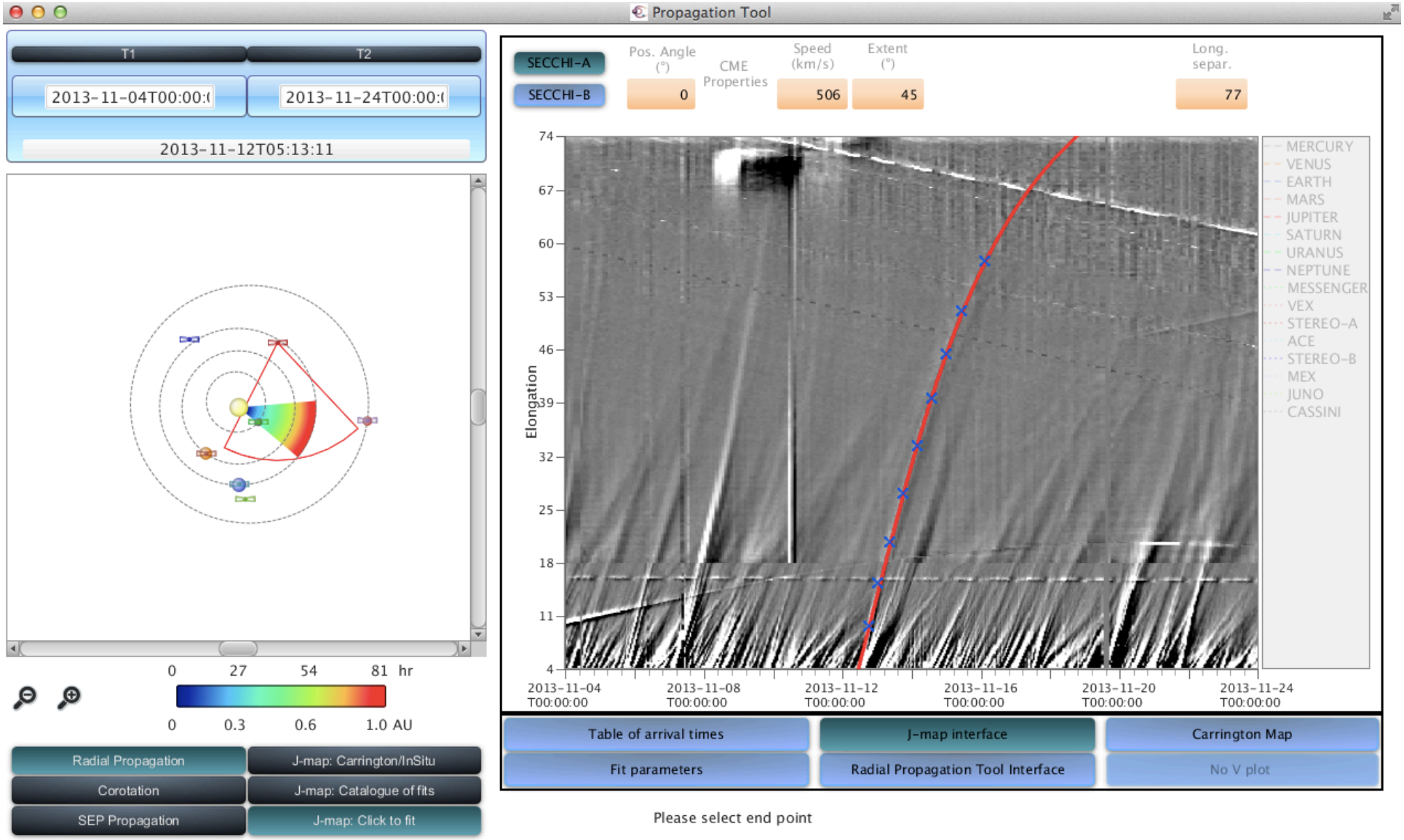

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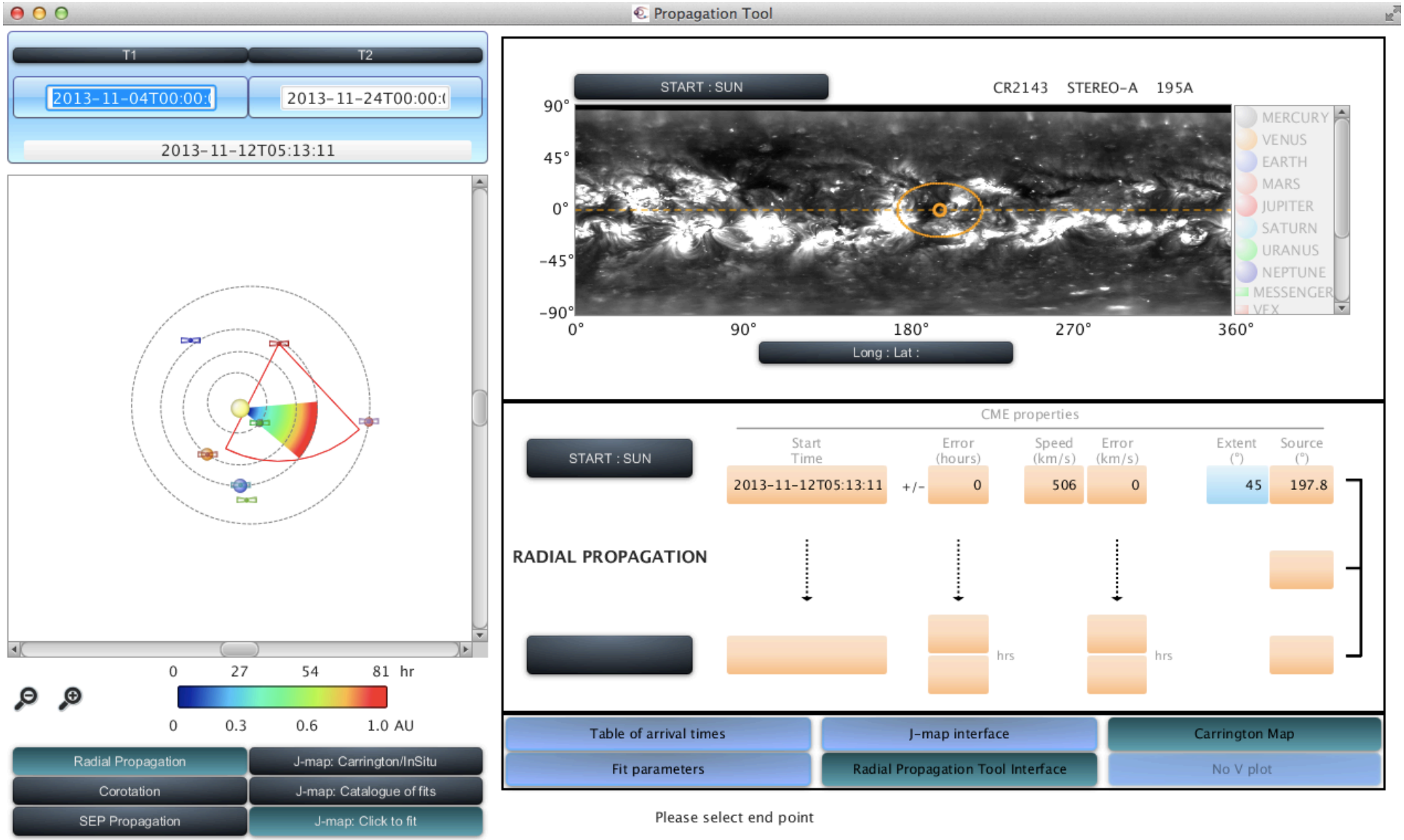

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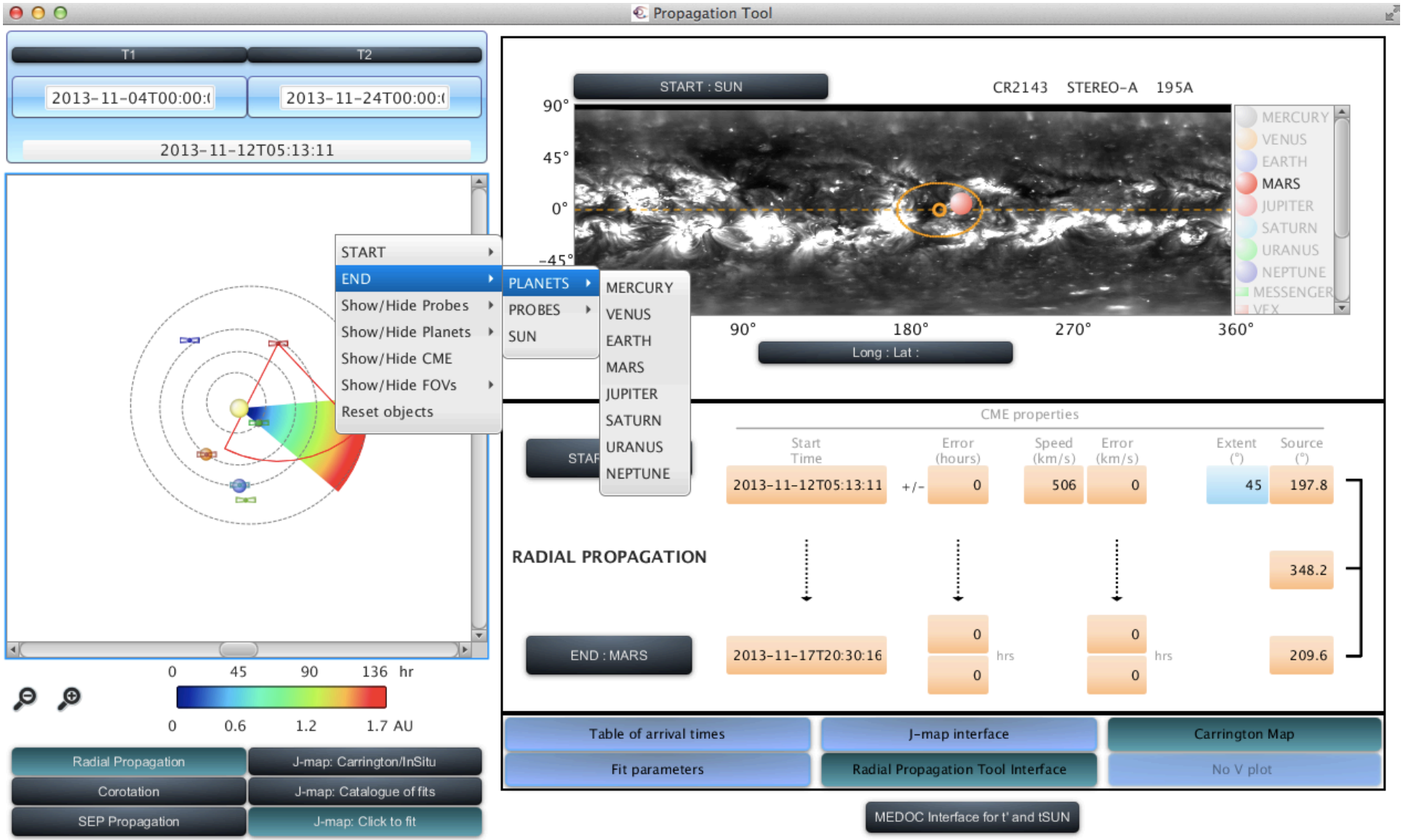

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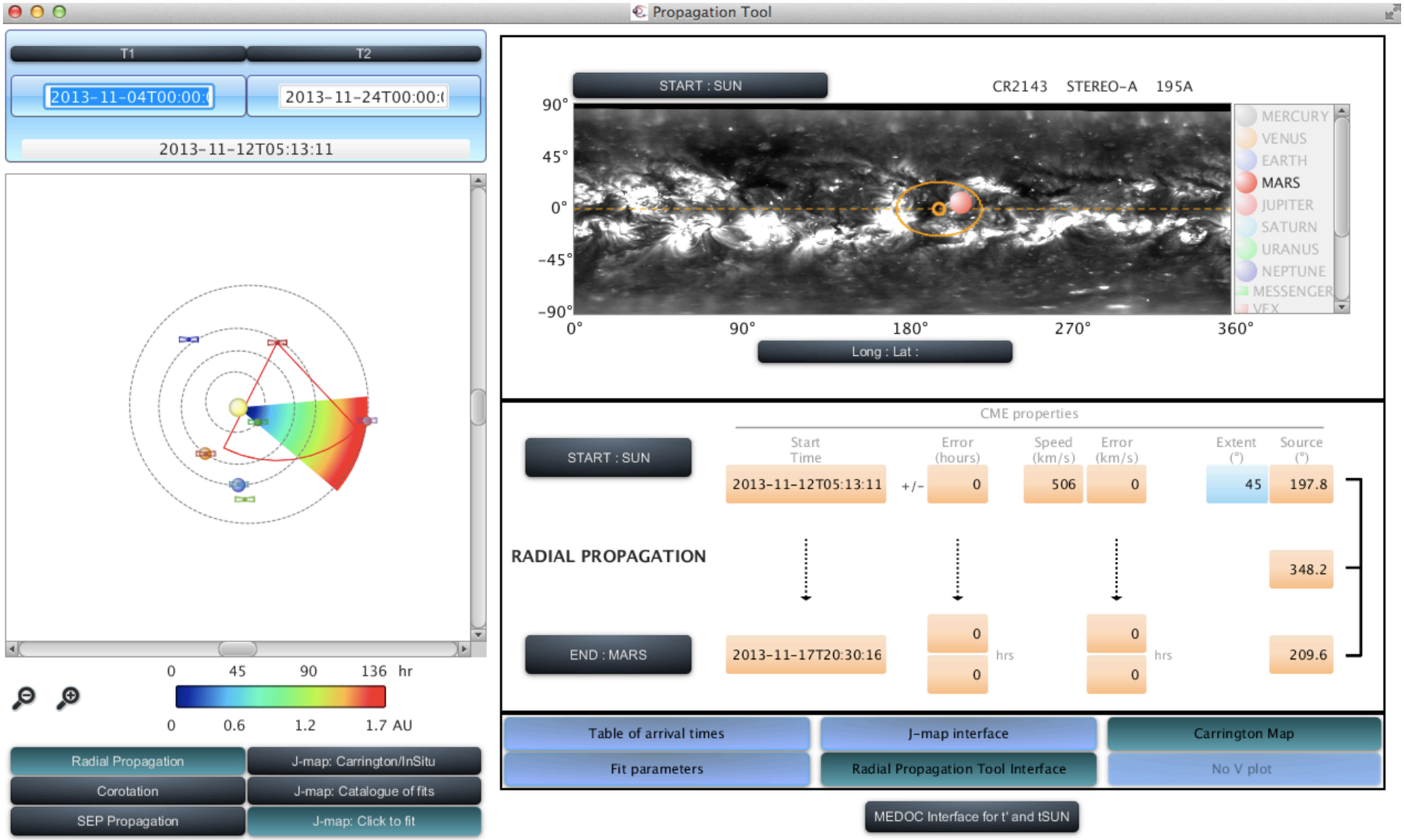


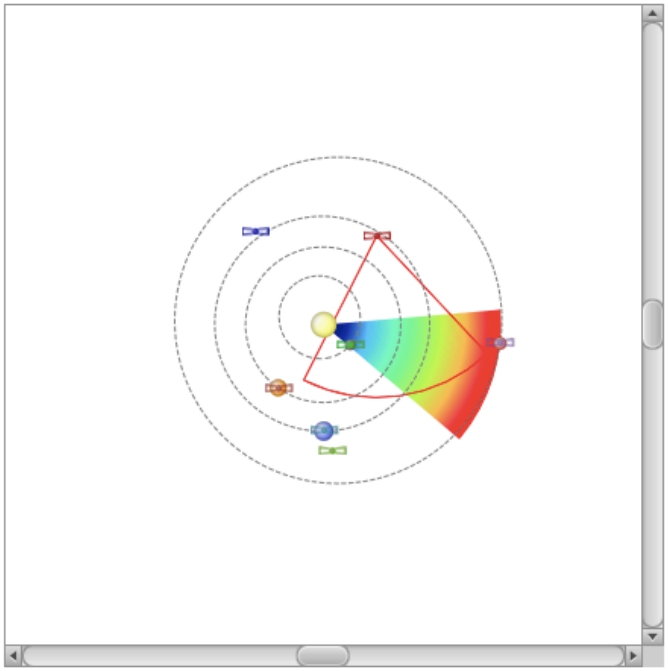
PROPAGATION TOOL

Propagation Tool

T1 | T2

2013-11-04T00:00:(| 2013-11-24T00:00:(

2013-11-12T05:13:11



0 45 90 136 hr

0 0.6 1.2 1.7 AU

Radial Propagation | J-map: Carrington/InSitu

Corotation | J-map: Catalogue of fits

SEP Propagation | J-map: Click to fit

TARGET	t'	t'min(Δt)	t'max(Δt)	t'min(ΔV)	t'max(...	|φCME(tSUN)−φTARGET(t...	r(T-SUN)	ΔφCME	φCME (source)
		(hrs)	(hrs)	(hrs)	(hrs)	(°)	(AU)	(°)	(°)
SUN	2013-11-12T05...	0	0	0	0	121.6	0	45	197.8
Probes									
MESSENGER	2013-11-13T06...	0	0	0	0	18.18	0.3067	45	197.8
VEX	2013-11-14T16...	0	0	0	0	107.59	0.7199	45	197.8
STEREO-A	2013-11-15T11...	0	0	0	0	283	0.9591	45	197.8
ACE	2013-11-15T13...	0	0	0	0	71.93	0.9757	45	197.8
STEREO-B	2013-11-15T21...	0	0	0	0	215.96	1.0717	45	197.8
MEX	2013-11-17T20...	0	0	0	0	348.21	1.6473	45	197.8
JUNO	2013-11-16T05...	0	0	0	0	68.25	1.1731	45	197.8
CASSINI	2013-12-16T00...	0	0	0	0	257.35	9.8755	45	197.8
Planets									
MERCURY	2013-11-13T06...	0	0	0	0	18.19	0.3067	45	197.8
VENUS	2013-11-14T16...	0	0	0	0	107.59	0.7199	45	197.8
EARTH	2013-11-15T14...	0	0	0	0	71.85	0.9852	45	197.8
MARS	2013-11-17T20...	0	0	0	0	348.21	1.6473	45	197.8
JUPITER	2013-11-29T21...	0	0	0	0	20.91	5.1691	45	197.8
SATURN	2013-12-15T22...	0	0	0	0	257.37	9.8565	45	197.8
URANUS	2014-01-19T18...	0	0	0	0	110.84	20.0316	45	197.8
NEPTUNE	2014-02-22T18...	0	0	0	0	147.37	29.9741	45	197.8

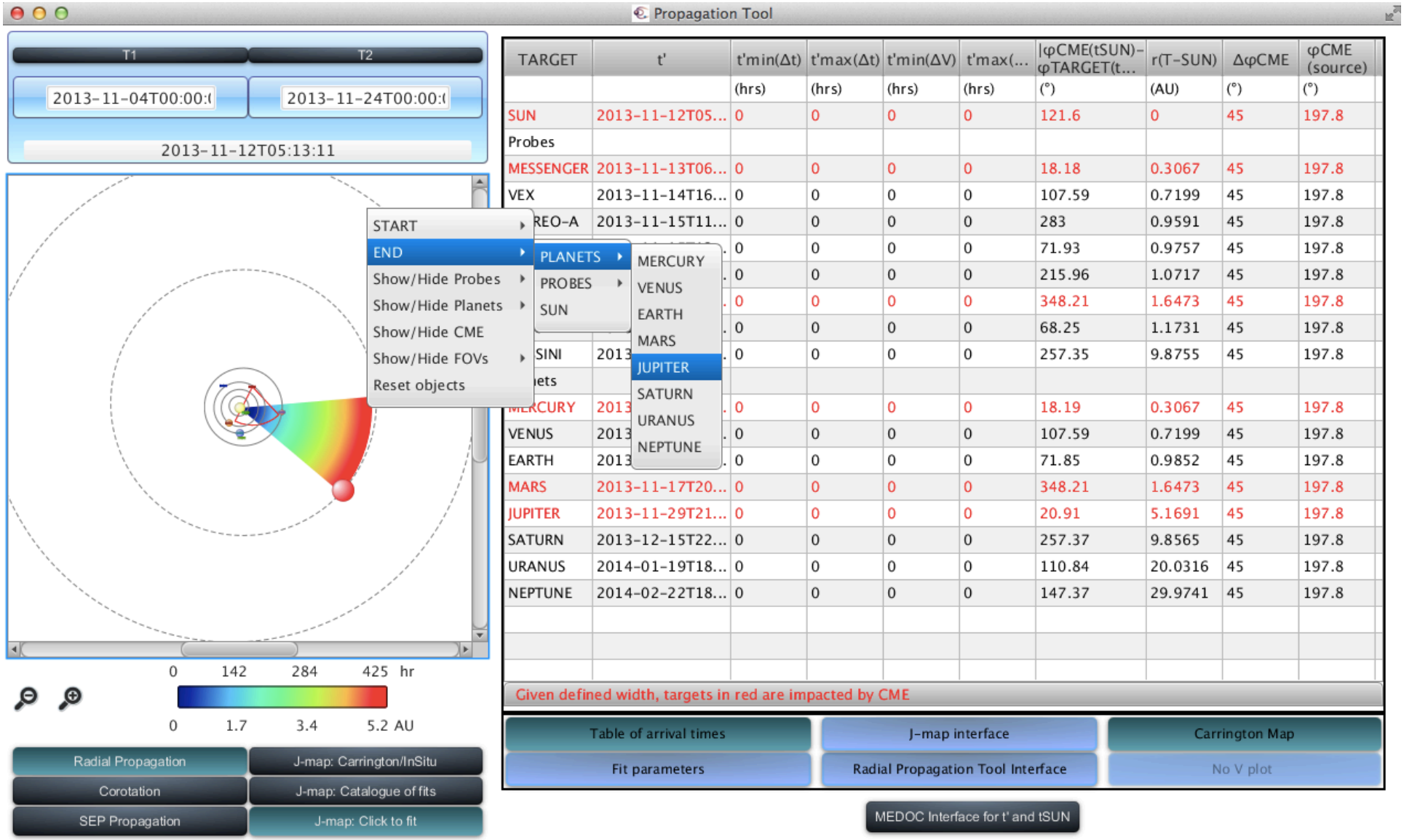
Given defined width, targets in red are impacted by CME

Table of arrival times | J-map interface | Carrington Map

Fit parameters | Radial Propagation Tool Interface | No V plot

MEDOC Interface for t' and tSUN

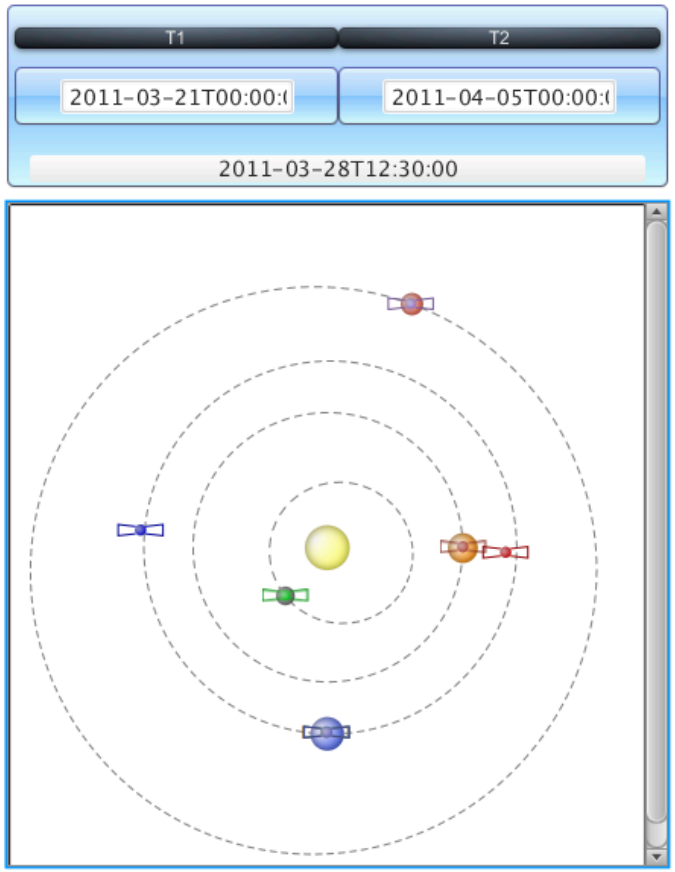
PROPAGATION TOOL



TARGET	t'	t'min(Δt) (hrs)	t'max(Δt) (hrs)	t'min(ΔV) (hrs)	t'max(... (hrs)	|φCME(tSUN)−φTARGET(t... (°)	r(T-SUN) (AU)	ΔφCME (°)	φCME (source) (°)
SUN	2013-11-12T05...	0	0	0	0	121.6	0	45	197.8
Probes									
MESSENGER	2013-11-13T06...	0	0	0	0	18.18	0.3067	45	197.8
VEX	2013-11-14T16...	0	0	0	0	107.59	0.7199	45	197.8
REO-A	2013-11-15T11...	0	0	0	0	283	0.9591	45	197.8
		0	0	0	0	71.93	0.9757	45	197.8
		0	0	0	0	215.96	1.0717	45	197.8
		0	0	0	0	348.21	1.6473	45	197.8
		0	0	0	0	68.25	1.1731	45	197.8
SINI	2013	0	0	0	0	257.35	9.8755	45	197.8
ets									
MERCURY	2013	0	0	0	0	18.19	0.3067	45	197.8
VENUS	2013	0	0	0	0	107.59	0.7199	45	197.8
EARTH	2013	0	0	0	0	71.85	0.9852	45	197.8
MARS	2013-11-17T20...	0	0	0	0	348.21	1.6473	45	197.8
JUPITER	2013-11-29T21...	0	0	0	0	20.91	5.1691	45	197.8
SATURN	2013-12-15T22...	0	0	0	0	257.37	9.8565	45	197.8
URANUS	2014-01-19T18...	0	0	0	0	110.84	20.0316	45	197.8
NEPTUNE	2014-02-22T18...	0	0	0	0	147.37	29.9741	45	197.8

USING THE RADIAL AND SEP TOOLs

PROPAGATION TOOL



Propagation Tool

Release 2.0.3 - 19/11/2013

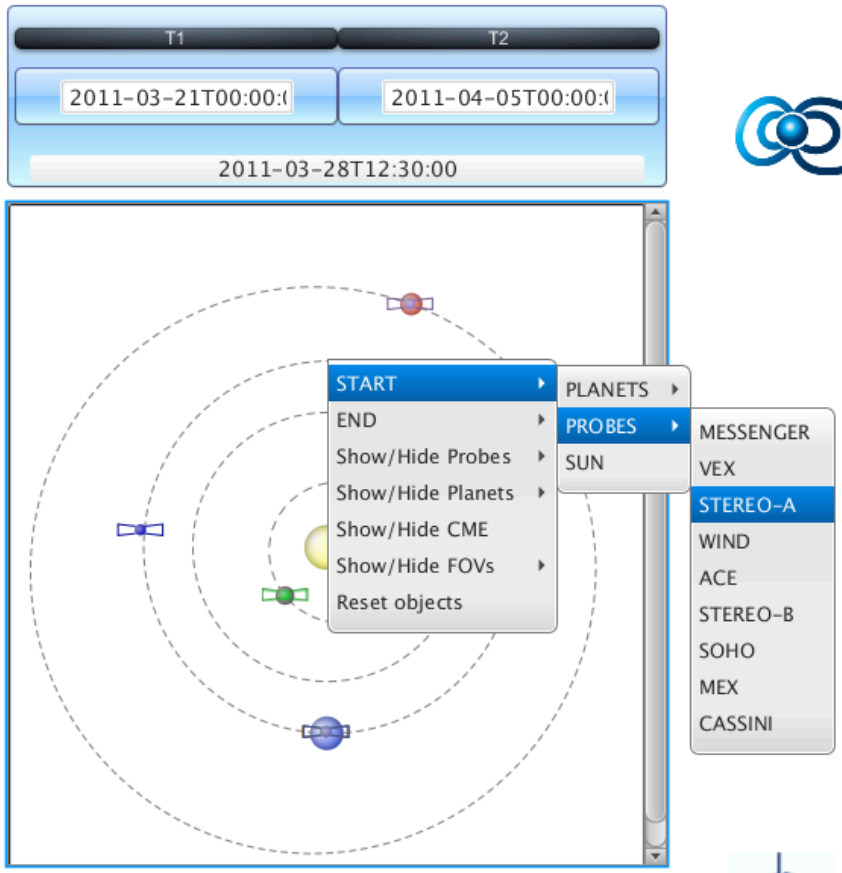
Please select Start/End

Radial Propagation | J-map: Carrington/InSitu

Corotation | J-map: Catalogue of fits

SEP Propagation | J-map: Click to fit

PROPAGATION TOOL

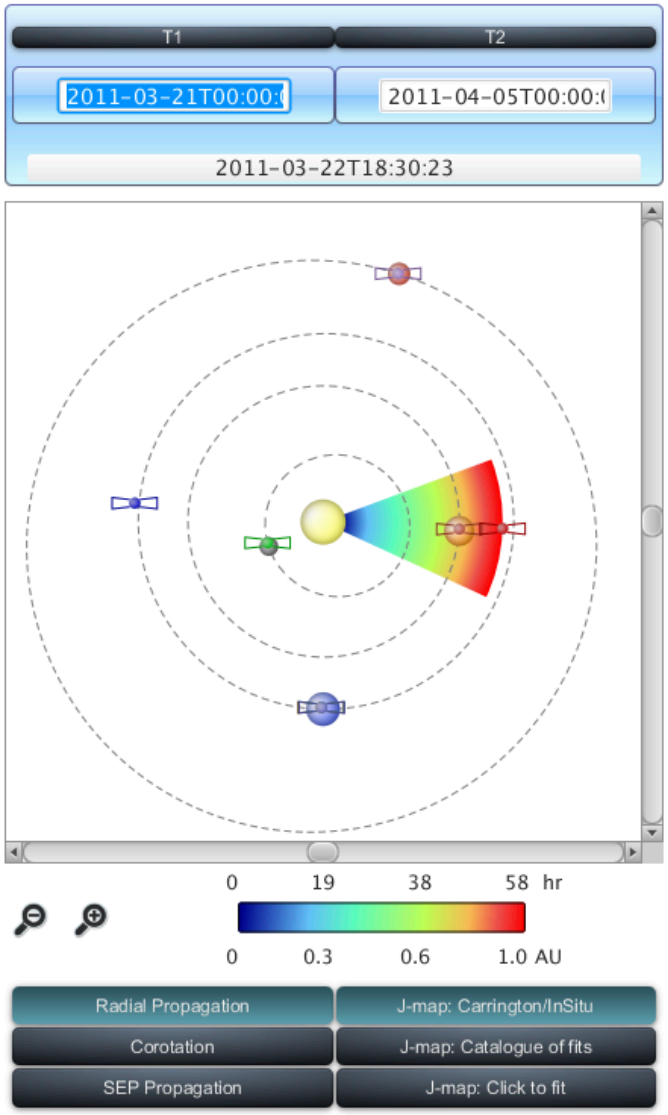


Propagation Tool

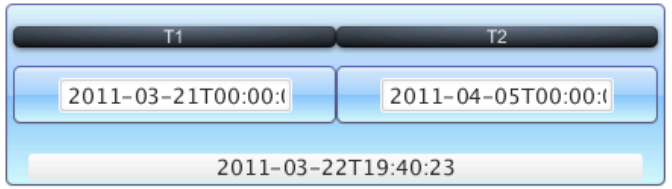
Release 2.0.3 - 19/11/2013

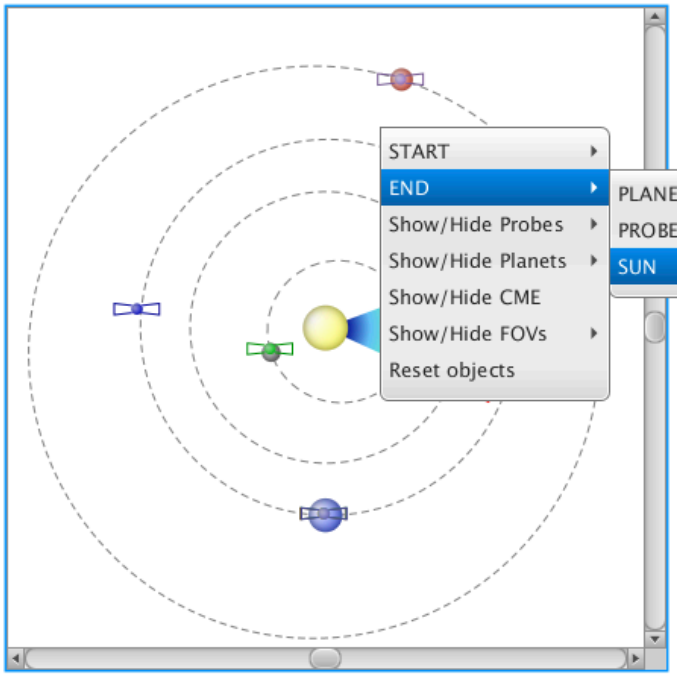
Please select Start/End

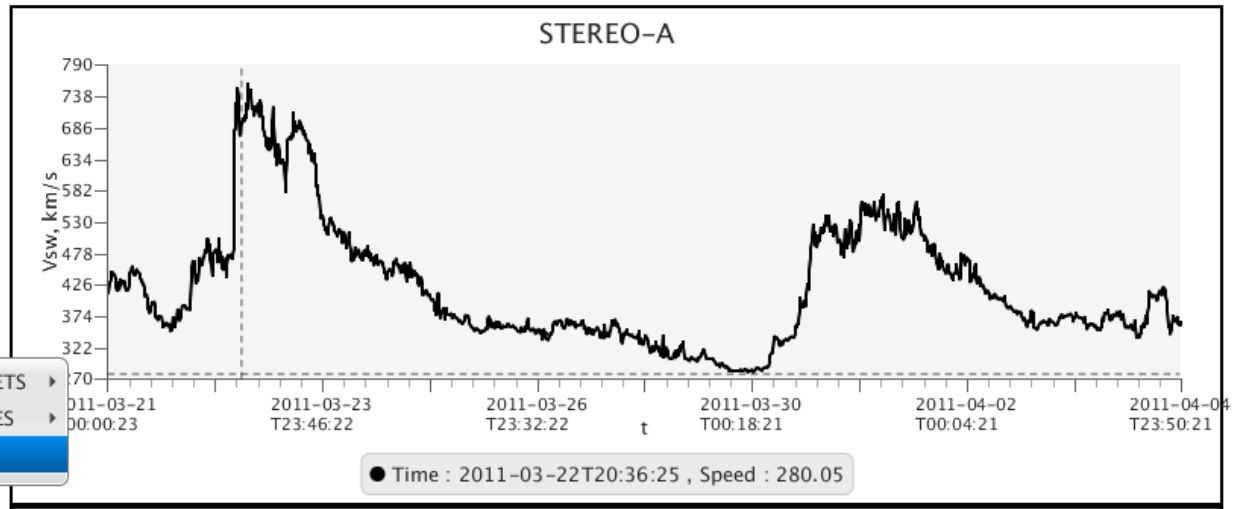
PROPAGATION TOOL

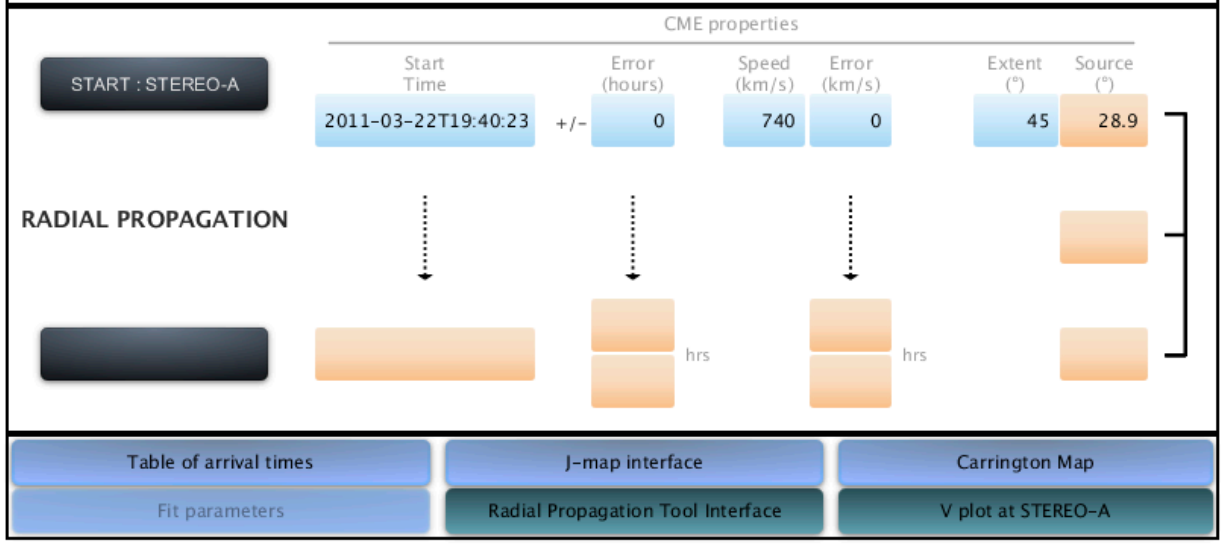


PROPAGATION TOOL

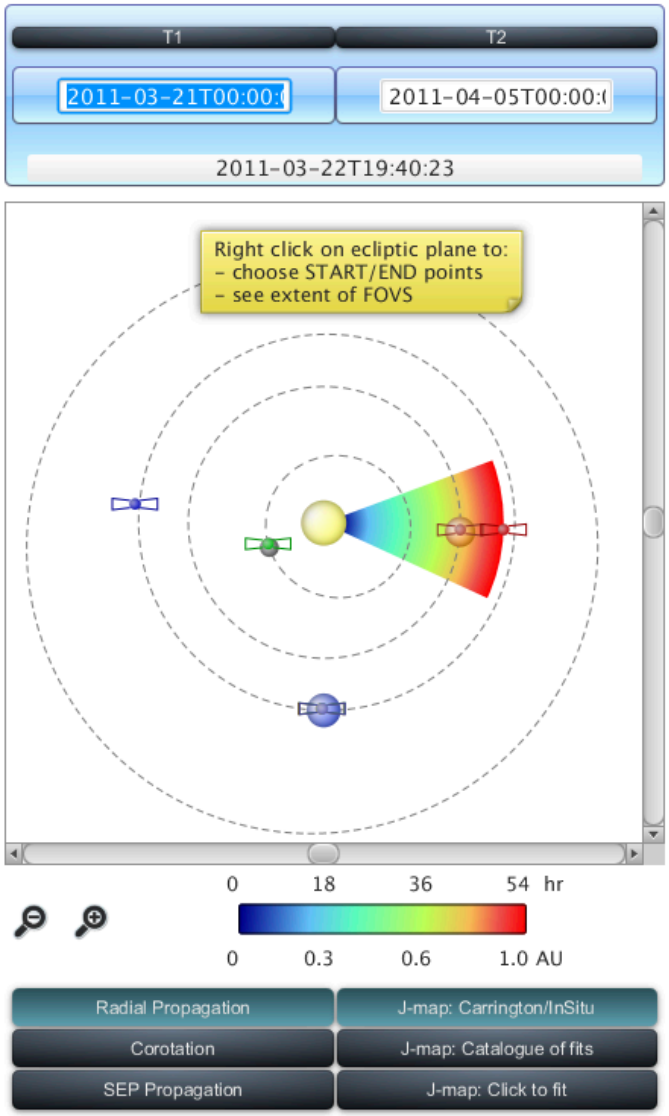




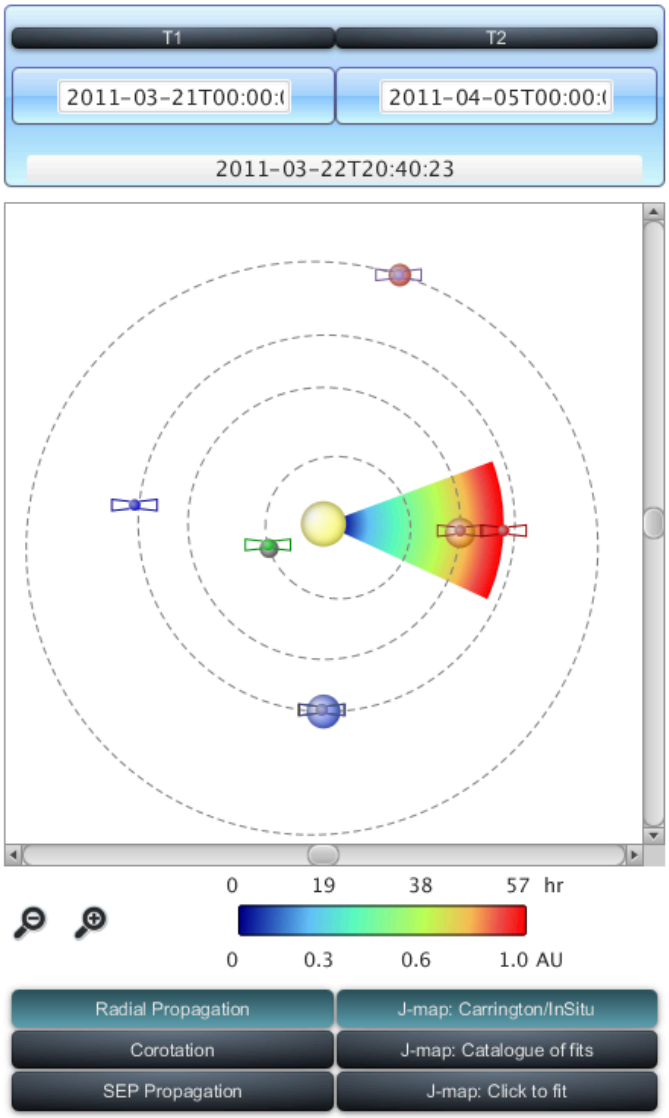


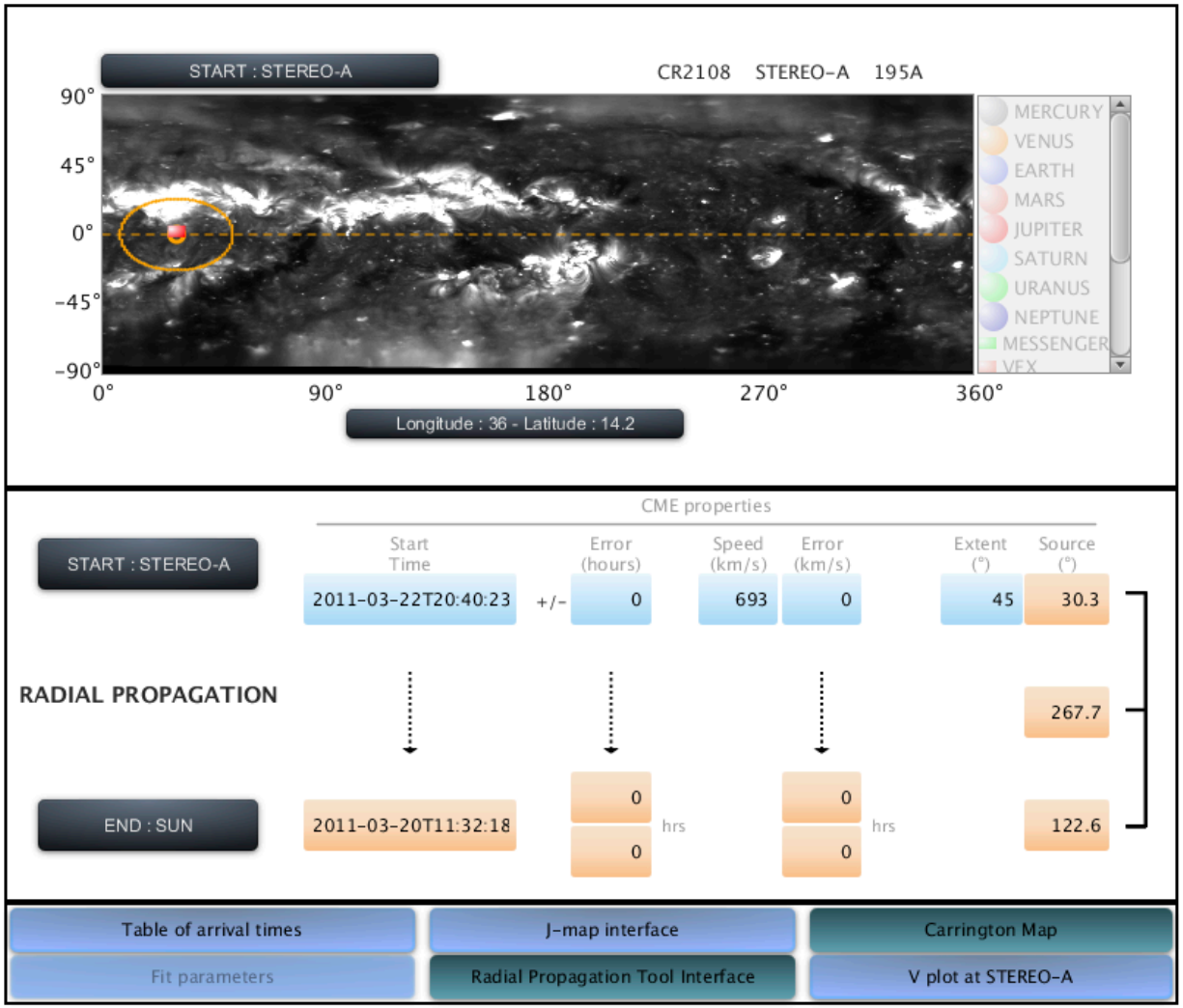


PROPAGATION TOOL

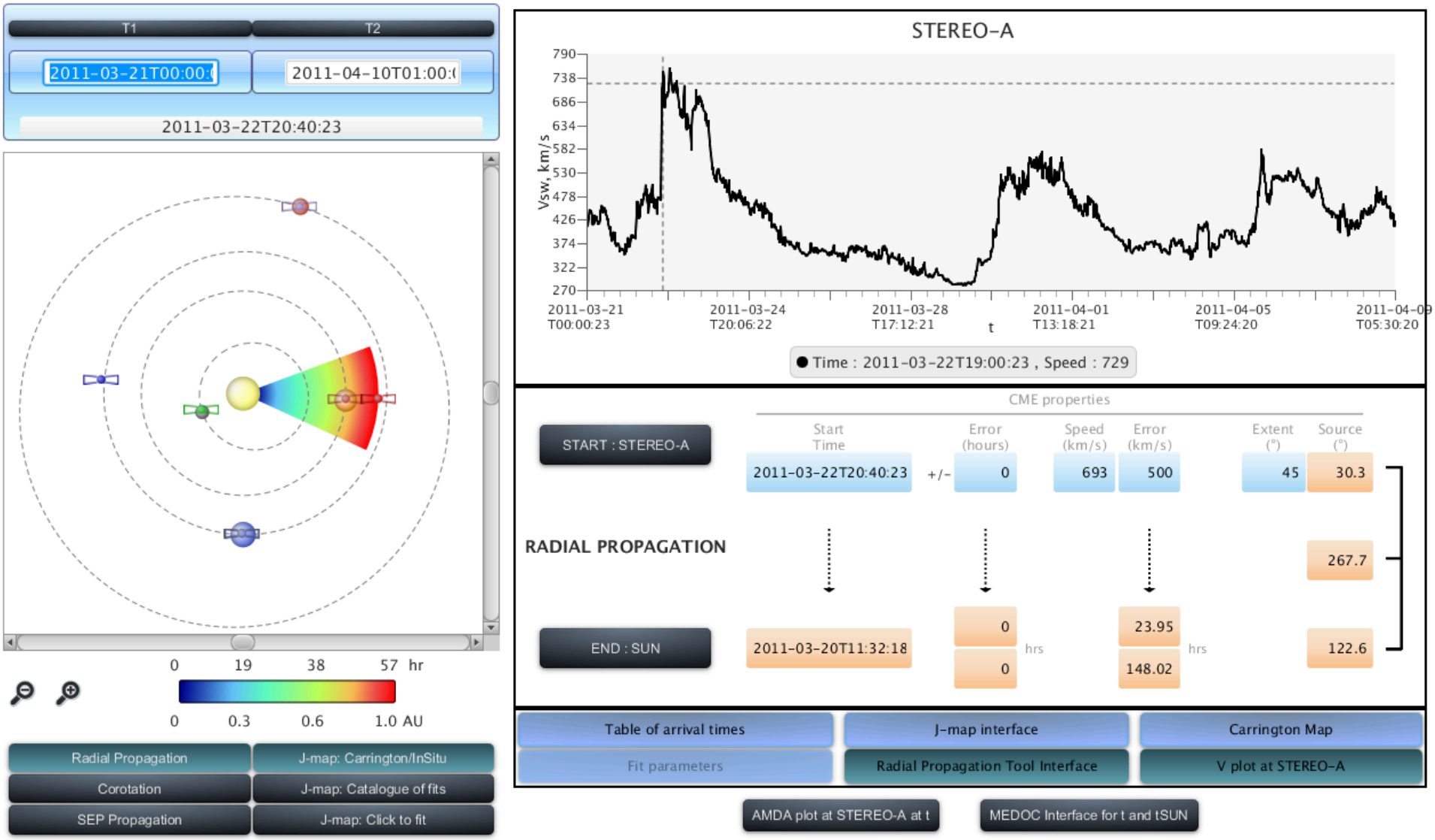


PROPAGATION TOOL

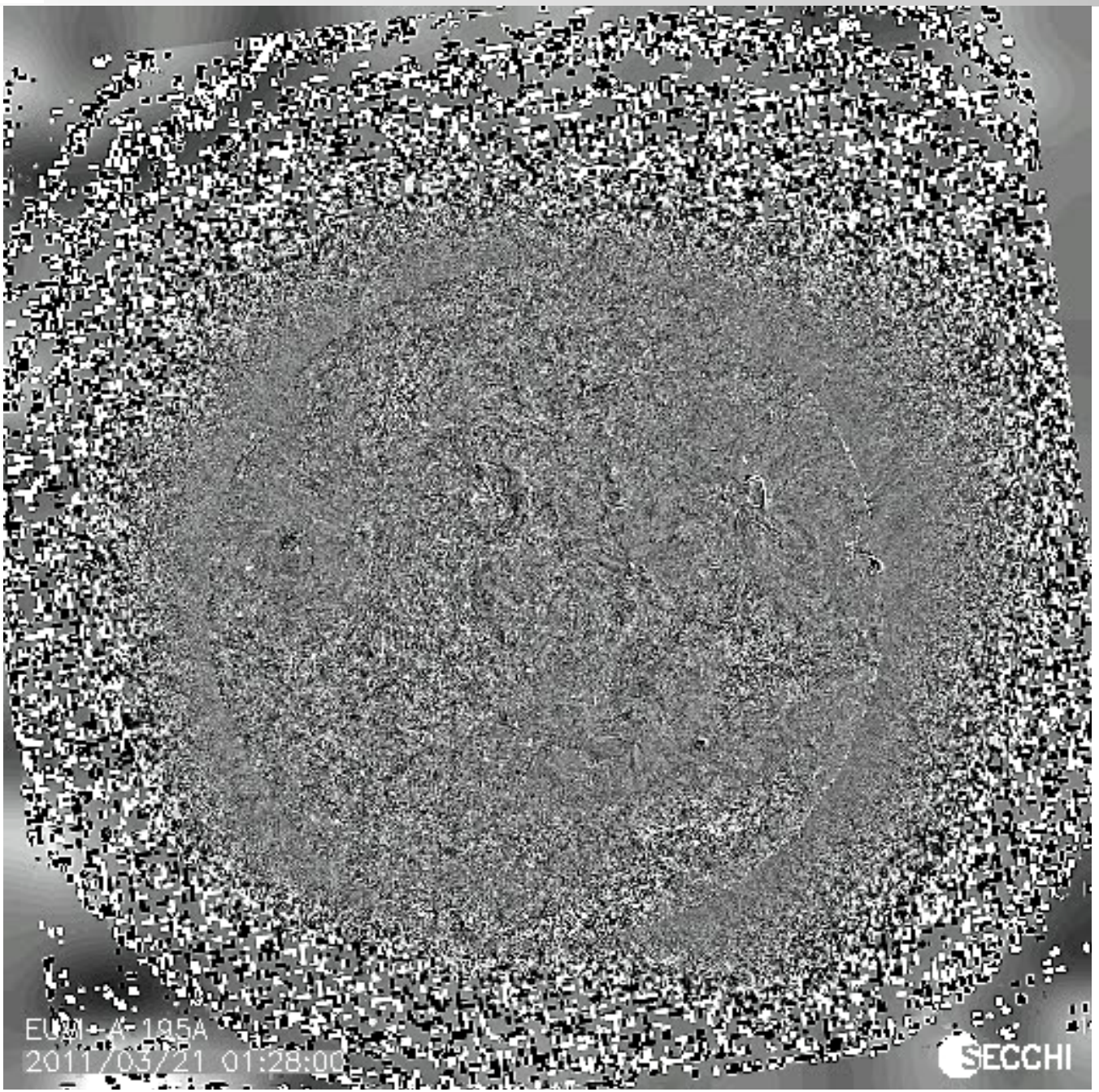




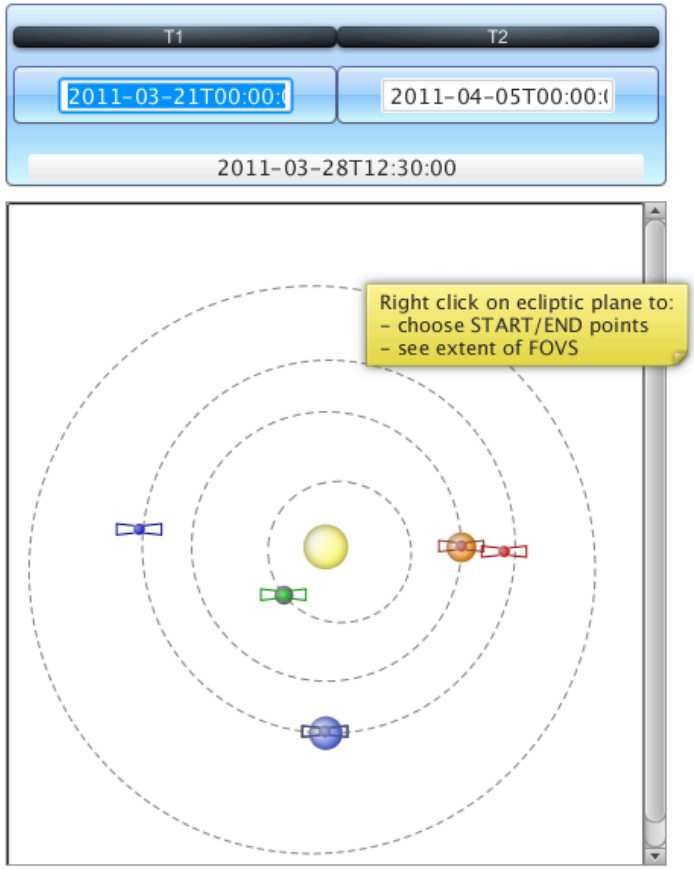
A major eruption occurred between 2011/03/20 11:32UT and 2011/03/21 11:32UT



PROPAGATION TOOL



PROPAGATION TOOL



Propagation Tool

Release 2.0.3 - 19/11/2013

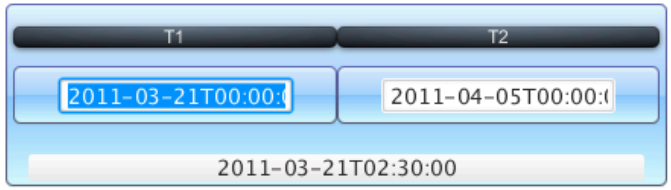
Please select Start/End

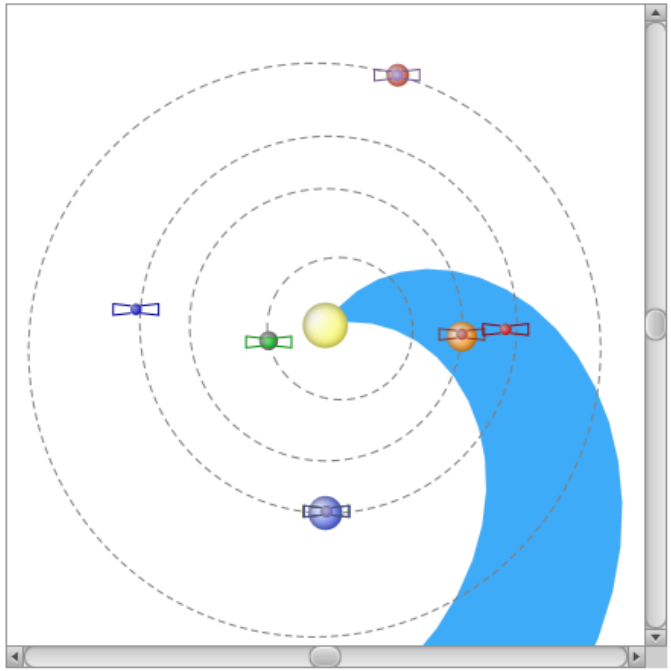
Radial Propagation | J-map: Carrington/InSitu

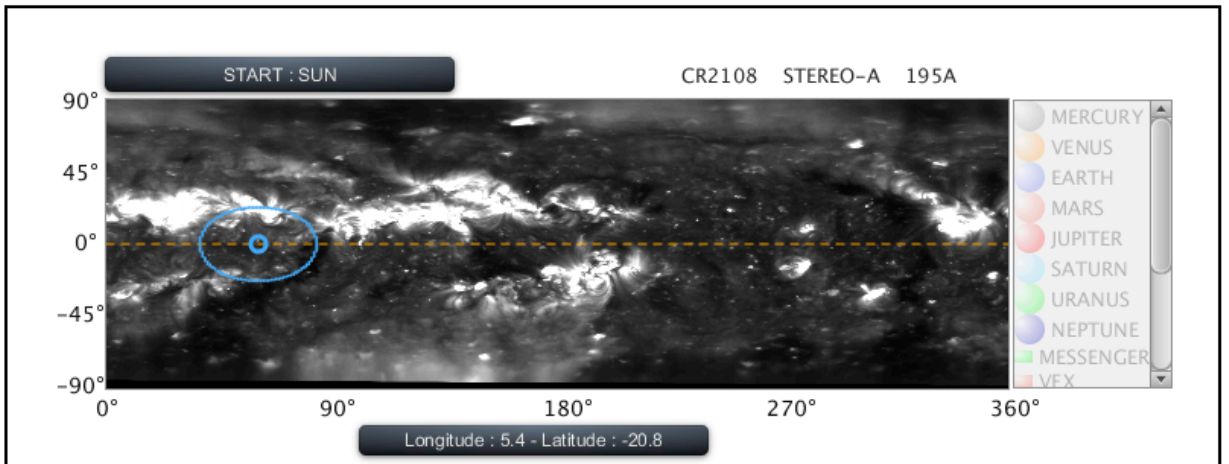
Corotation | J-map: Catalogue of fits

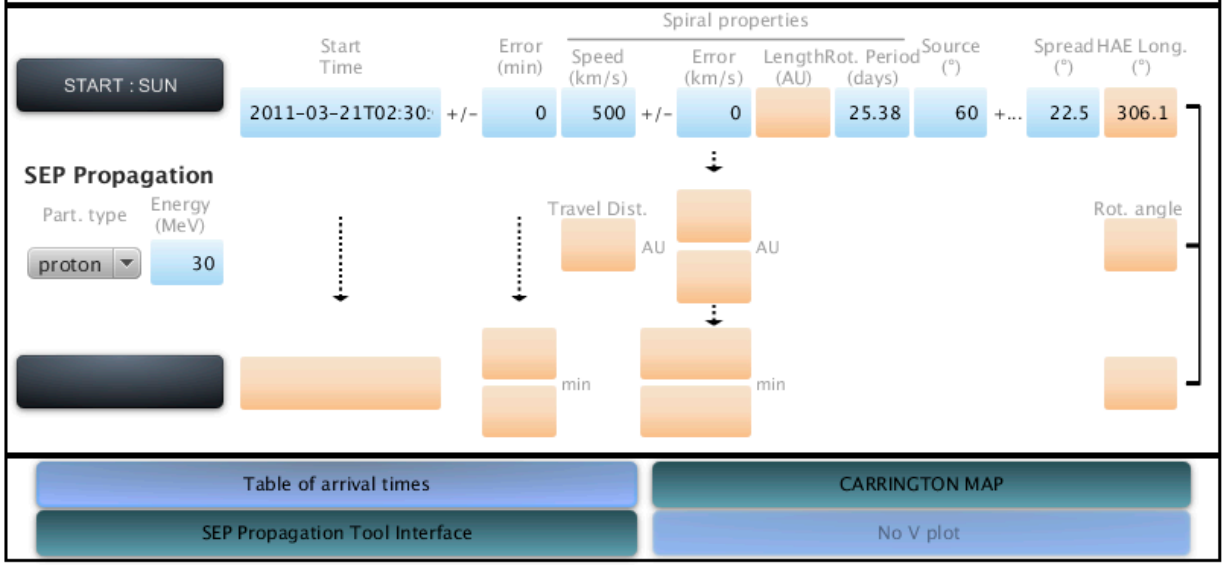
SEP Propagation | J-map: Click to fit

PROPAGATION TOOL



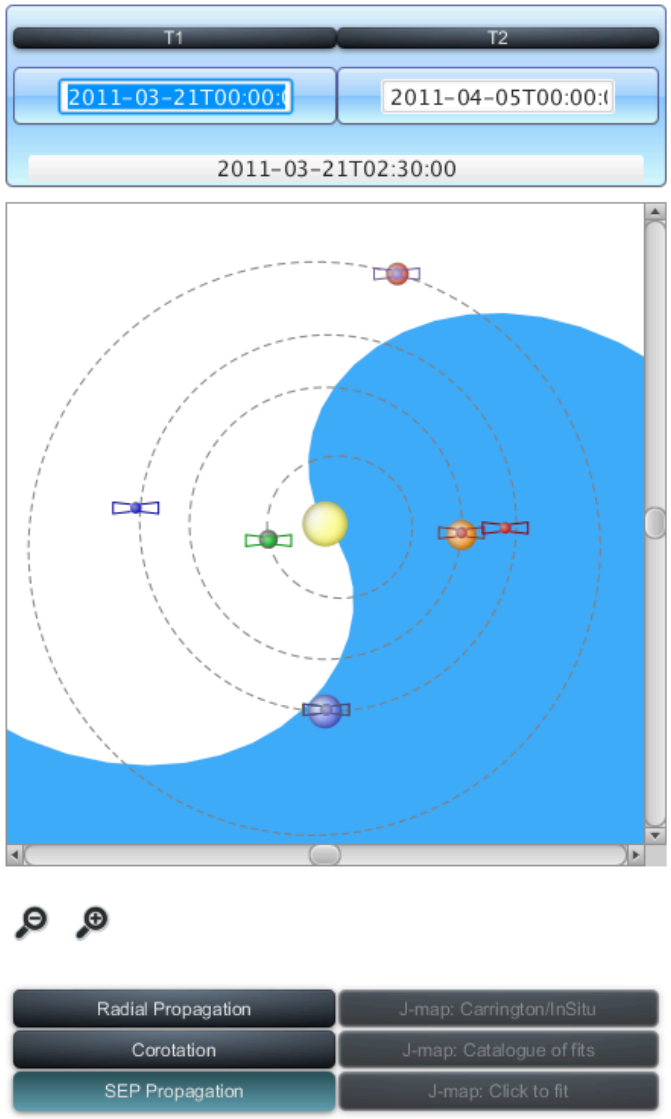


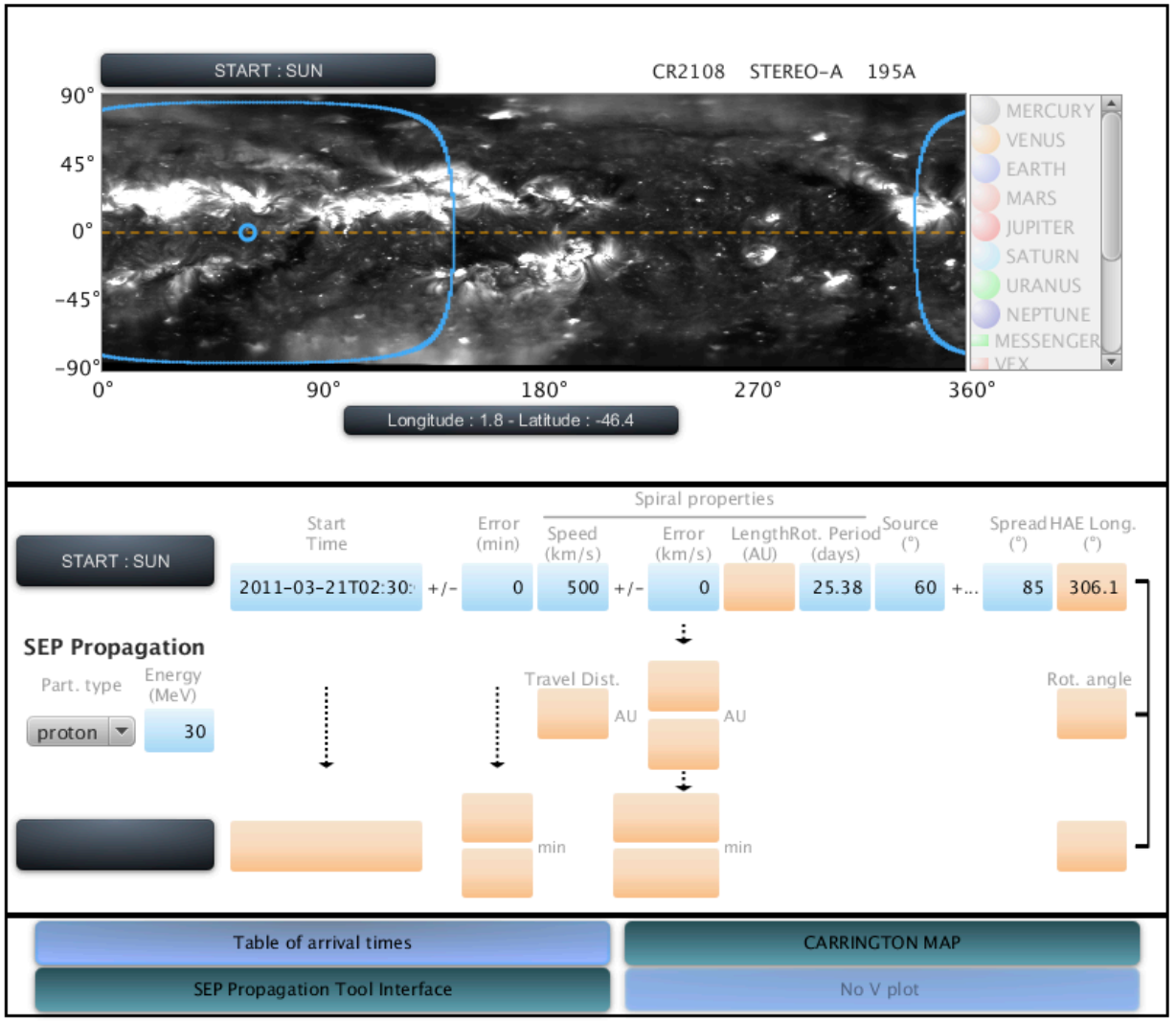




Please select end point

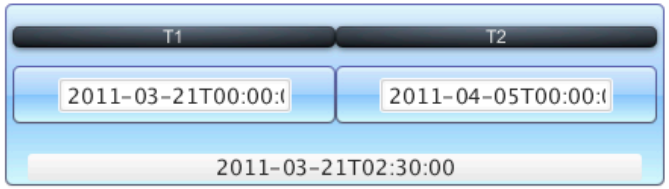
PROPAGATION TOOL

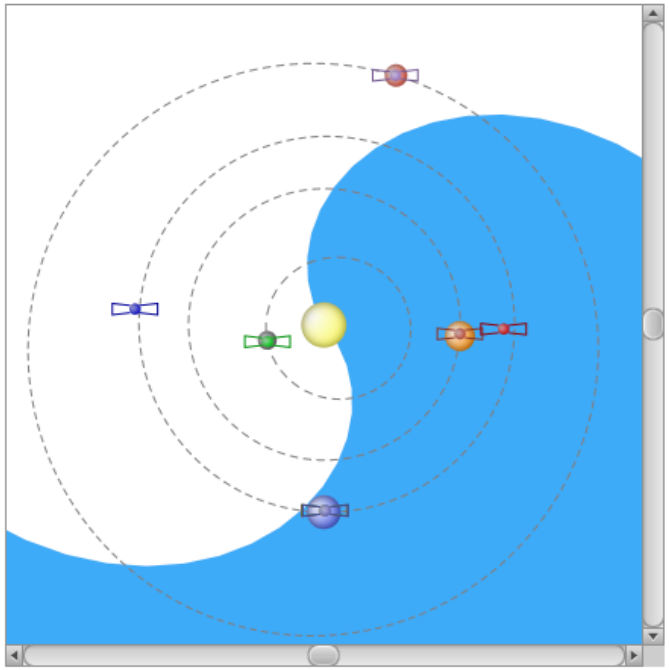




Please select end point

PROPAGATION TOOL





TARGET	t'	t'min (Δt)	t'max (Δt)	t'min (ΔV)	t'max (ΔV)	|φSTART(t)-φTARGET(...	Length	ΔφSp...	φSpiral (sour...	Particle	Energy
		(min)	(min)	(min)	(min)	(°)	(AU)	(°)	(°)		(MeV)
SUN	2011-03-21T02...	0	0	0	0	300	0	85	60	proton	30
Probes											
MESSENGER	2011-03-21T02...	0	0	0	0	160.68	0.3071	85	60	proton	30
VEX	2011-03-21T02...	0	0	0	0	319.63	0.7612	85	60	proton	30
STEREO-A	2011-03-21T03...	0	0	0	0	322.22	1.0458	85	60	proton	30
WIND	2011-03-21T03...	0	0	0	0	233.58	1.0839	85	60	proton	30
ACE	2011-03-21T03...	0	0	0	0	233.9	1.0824	85	60	proton	30
STEREO-B	2011-03-21T03...	0	0	0	0	138.68	1.1123	85	60	proton	30
SOHO	2011-03-21T03...	0	0	0	0	234.04	1.0843	85	60	proton	30
MEX	2011-03-21T03...	0	0	0	0	37.34	1.6464	85	60	proton	30
CASSINI	2011-03-22T01...	0	0	0	0	247.13	41.38...	85	60	proton	30
Planets											
MERCURY	2011-03-21T02...	0	0	0	0	160.67	0.3071	85	60	proton	30
VENUS	2011-03-21T02...	0	0	0	0	319.63	0.7614	85	60	proton	30
EARTH	2011-03-21T03...	0	0	0	0	233.81	1.0958	85	60	proton	30
MARS	2011-03-21T03...	0	0	0	0	37.34	1.6464	85	60	proton	30
JUPITER	2011-03-21T09...	0	0	0	0	68.67	12.01...	85	60	proton	30
SATURN	2011-03-22T01...	0	0	0	0	247.15	41.41...	85	60	proton	30
URANUS	2011-03-25T04...	0	0	0	0	54.28	175.3...	85	60	proton	30
NEPTUNE	2011-03-30T05...	0	0	0	0	22.33	388.7...	85	60	proton	30

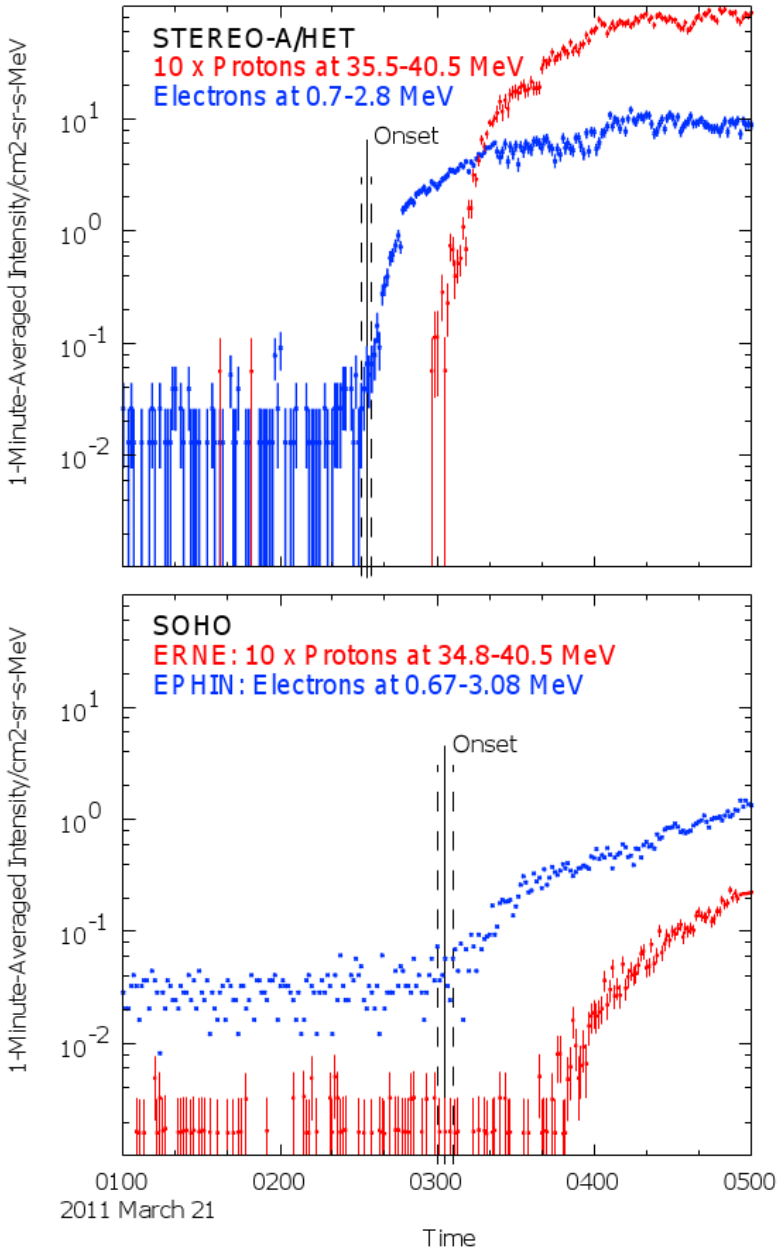
Given defined width, targets in red are impacted by SEP

Radial Propagation | J-map: Carrington/InSitu
Corotation | J-map: Catalogue of fits
SEP Propagation | J-map: Click to fit

Table of arrival times | CARRINGTON MAP
SEP Propagation Tool Interface | No V plot

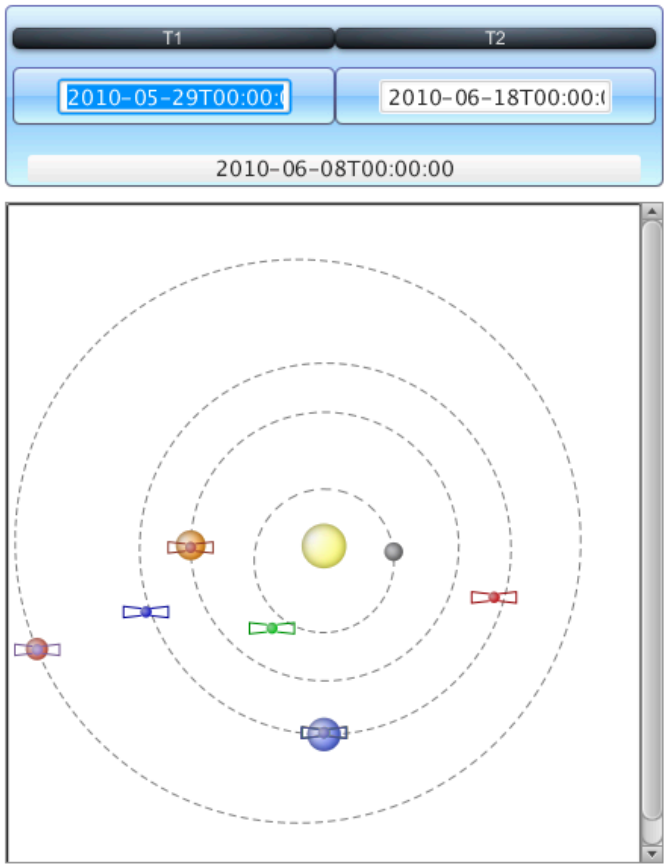
Please select end point

PROPAGATION TOOL



MODE COROTATION

PROPAGATION TOOL



Propagation Tool

Release 2.0.3 - 19/11/2013

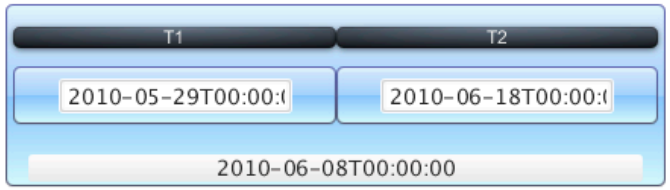
Please select Start/End

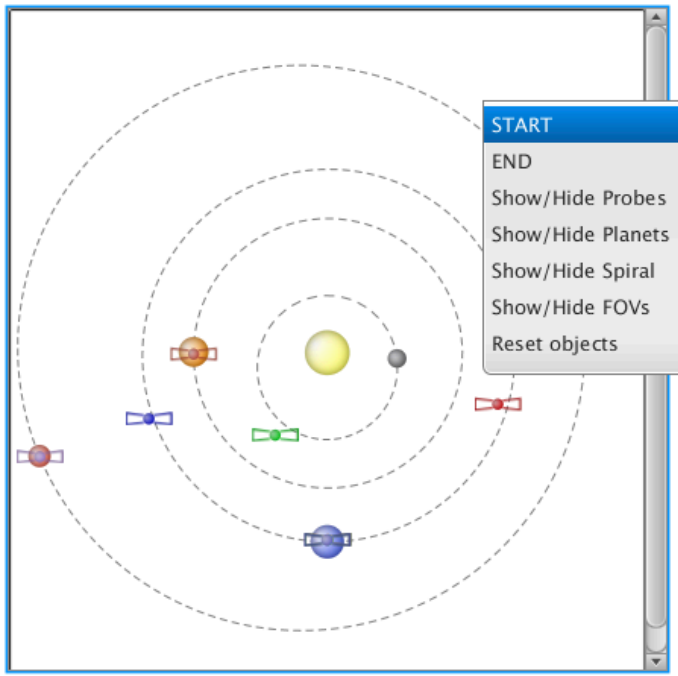
Radial Propagation | J-map: Carrington/InSitu

Corotation | J-map: Catalogue of fits

SEP Propagation | J-map: Click to fit

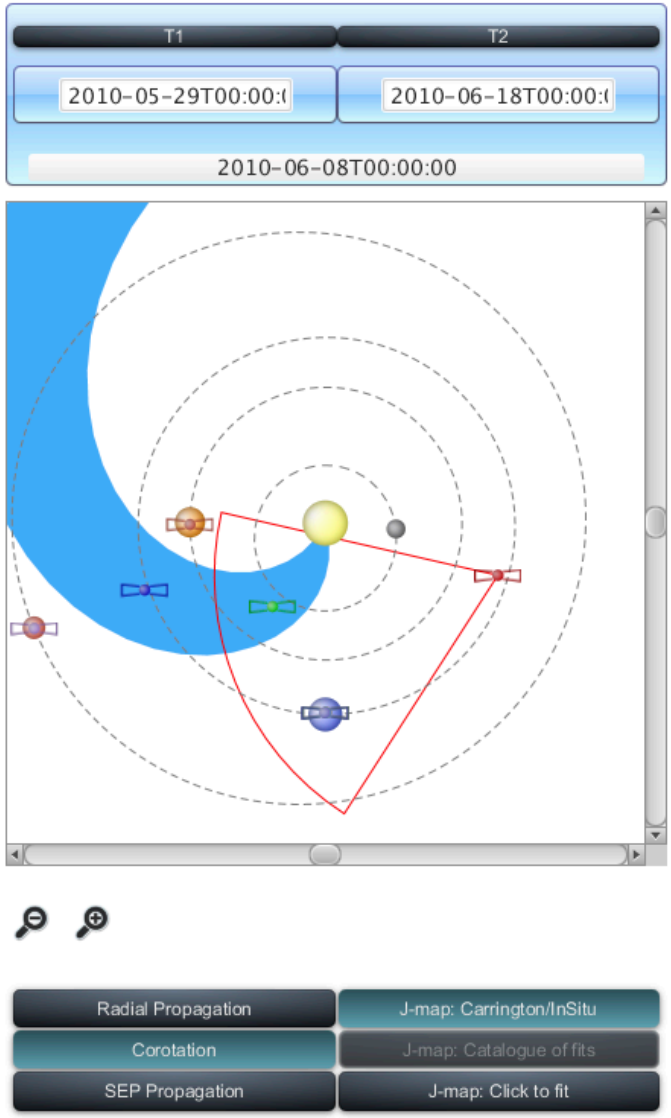
PROPAGATION TOOL

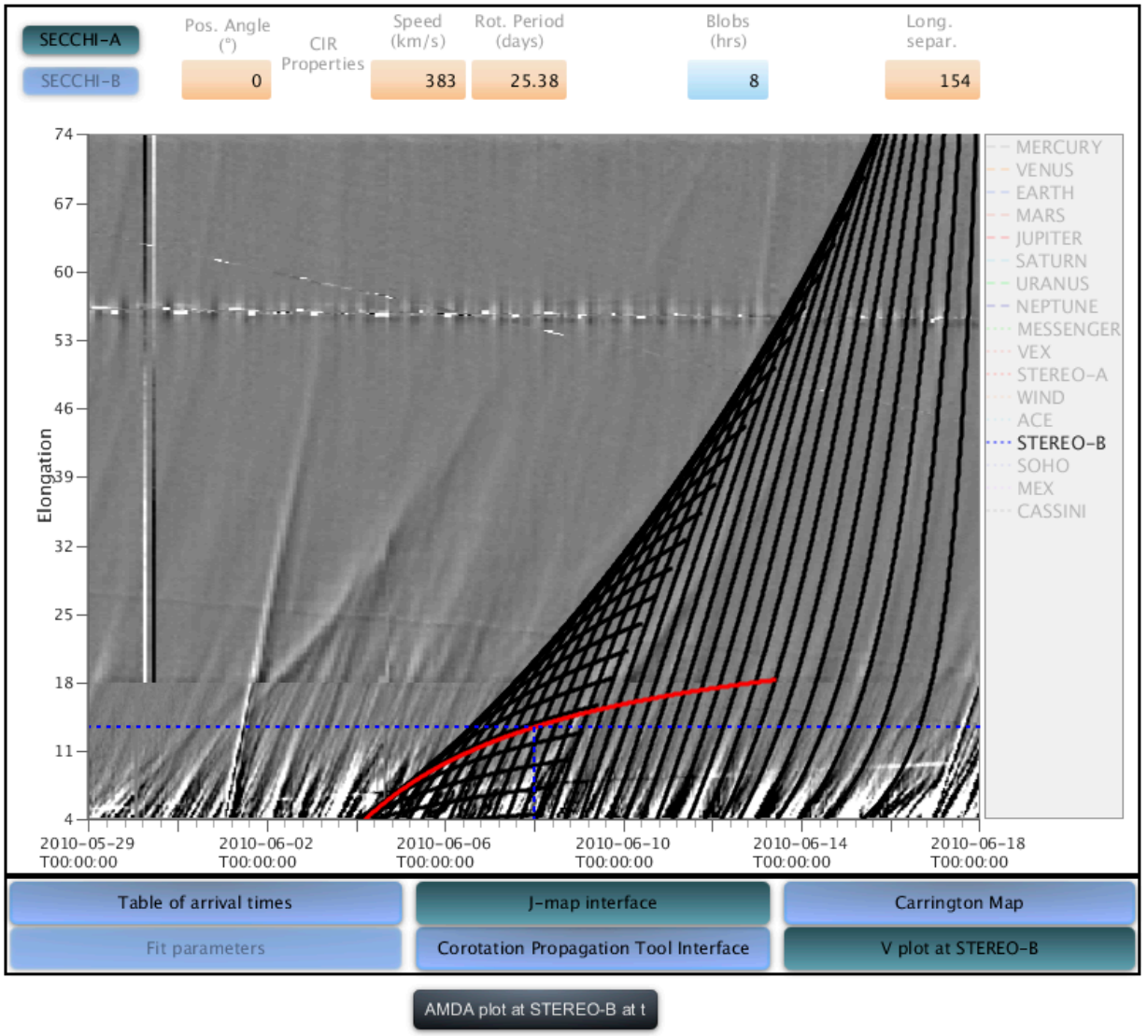




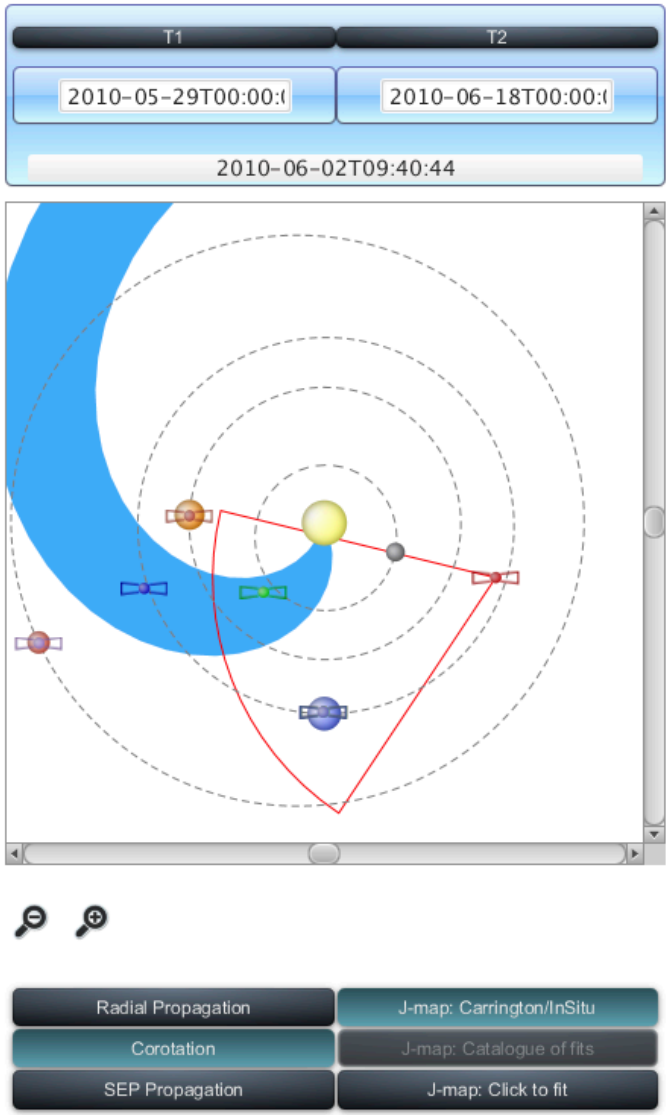
ase select Start/End

PROPAGATION TOOL

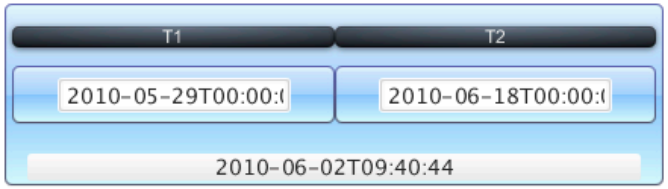


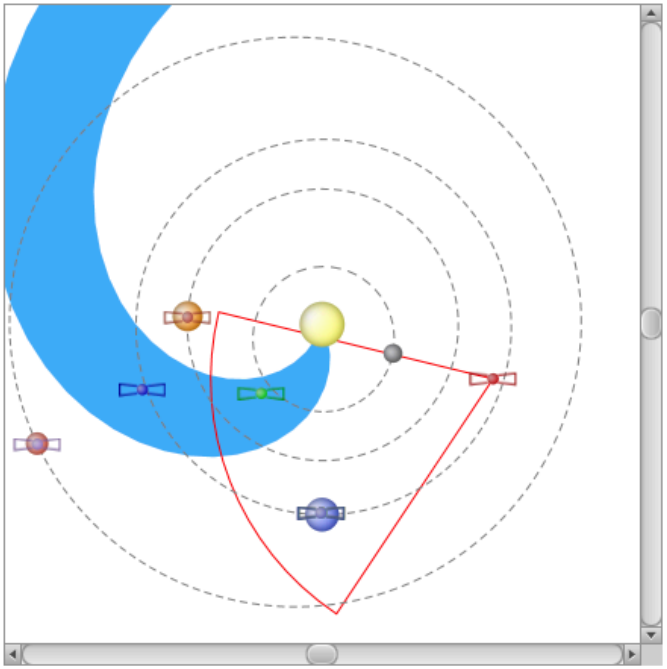


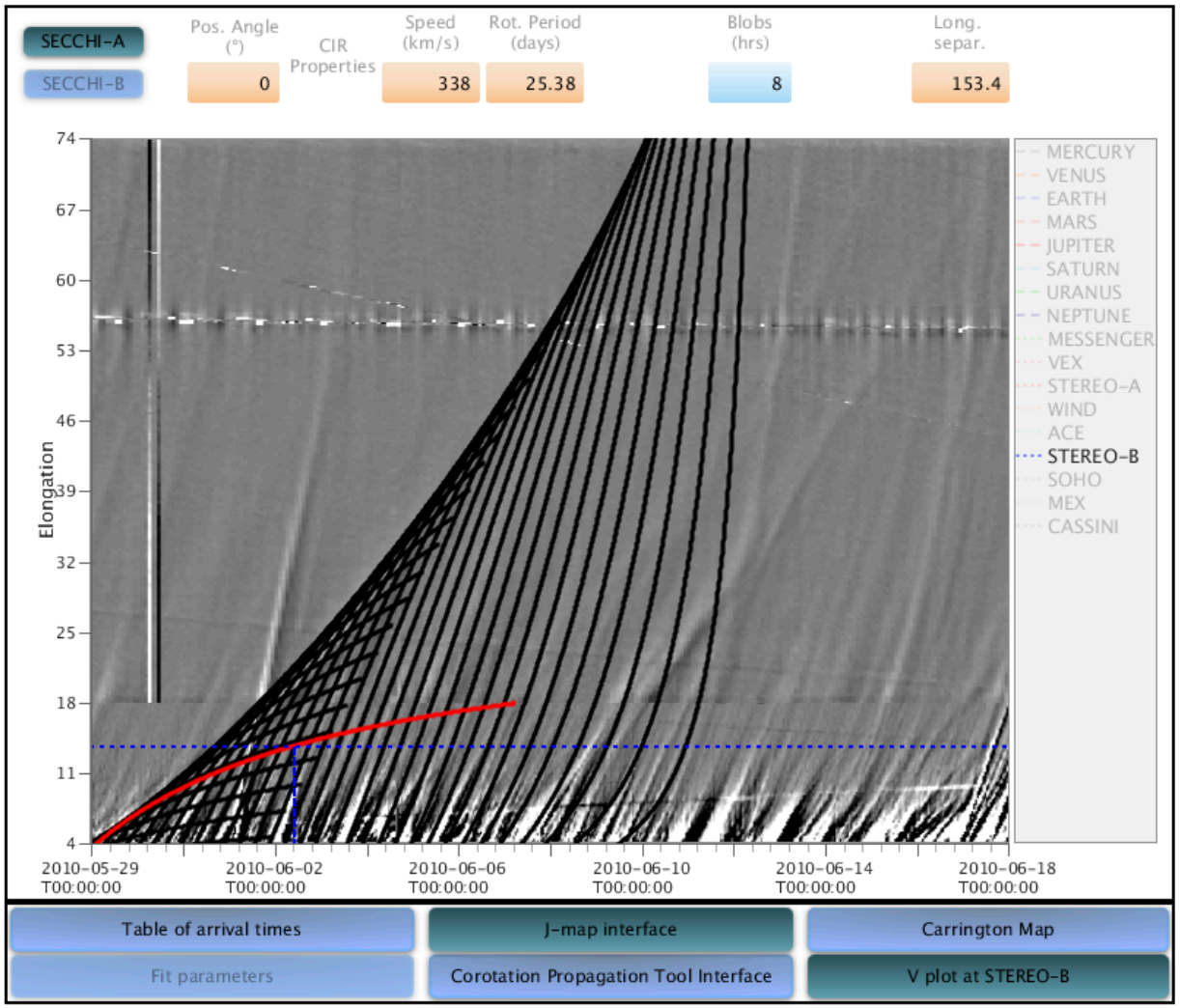
PROPAGATION TOOL



PROPAGATION TOOL





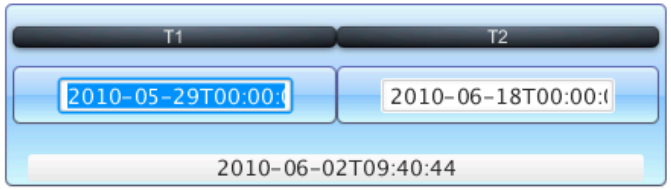


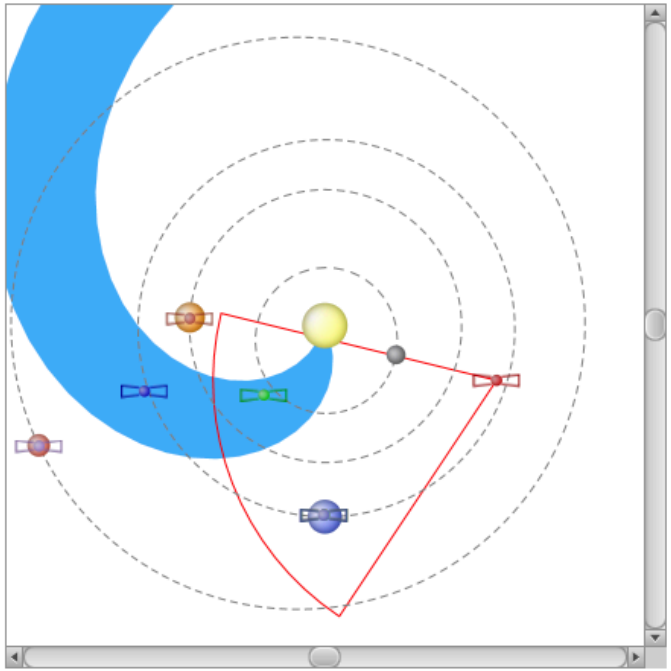
Radial Propagation
Corotation
SEP Propagation
J-map: Carrington/InSitu
J-map: Catalogue of fits
J-map: Click to fit

Table of arrival times
Fit parameters
J-map interface
Corotation Propagation Tool Interface
Carrington Map
V plot at STEREO-B

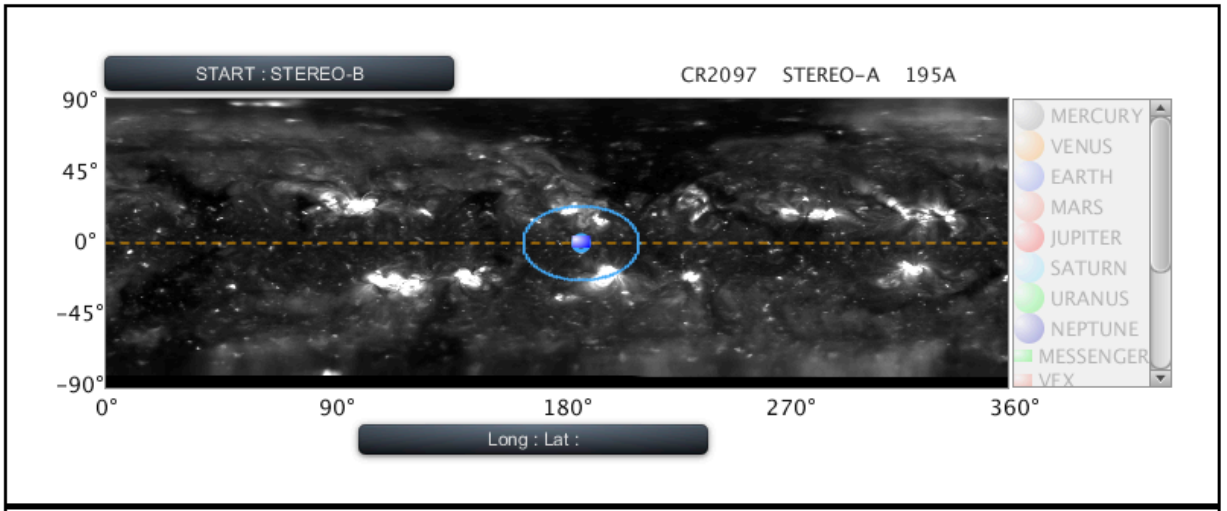
AMDA plot at STEREO-B at t

PROPAGATION TOOL





Radial Propagation | J-map: Carrington/InSitu
Corotation | J-map: Catalogue of fits
SEP Propagation | J-map: Click to fit



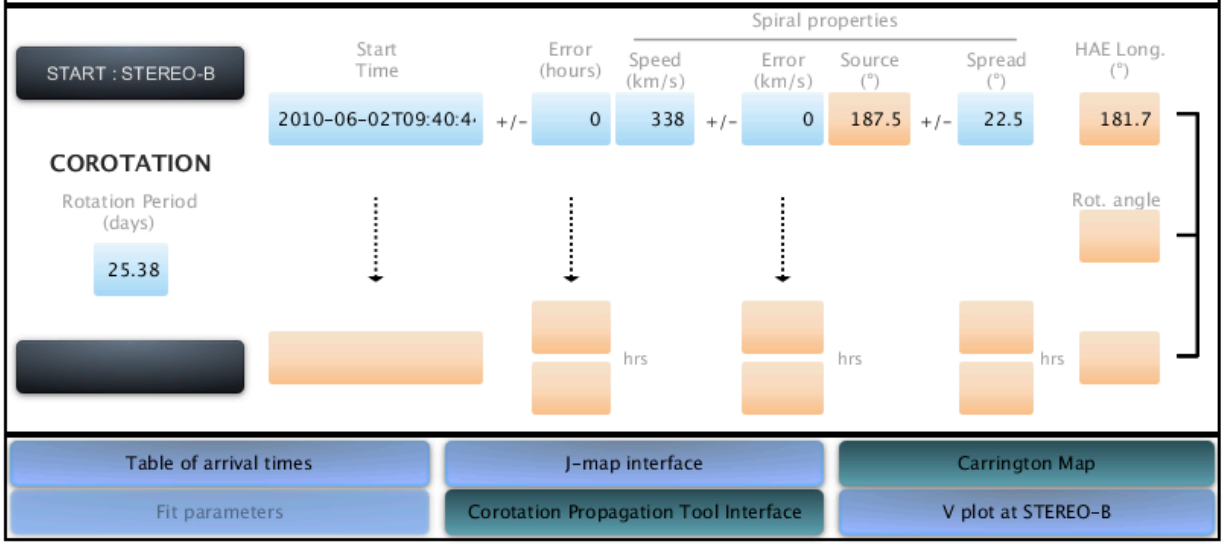
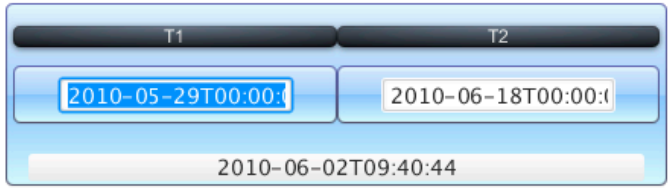
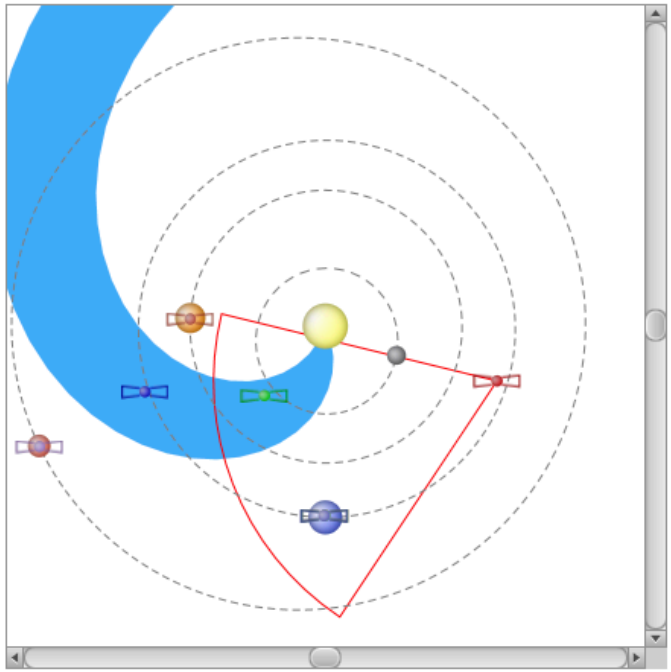


Table of arrival times | J-map interface | Carrington Map
Fit parameters | Corotation Propagation Tool Interface | V plot at STEREO-B

AMDA plot at STEREO-B at t

PROPAGATION TOOL



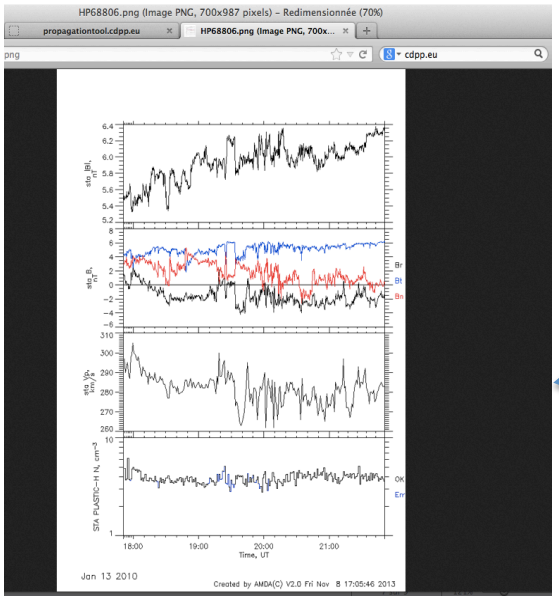
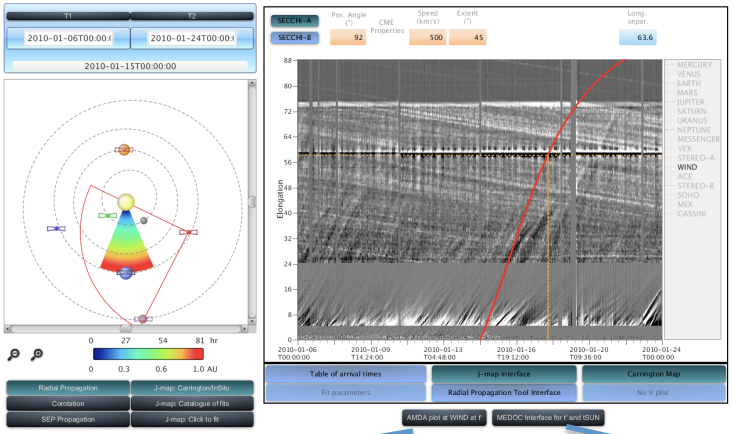
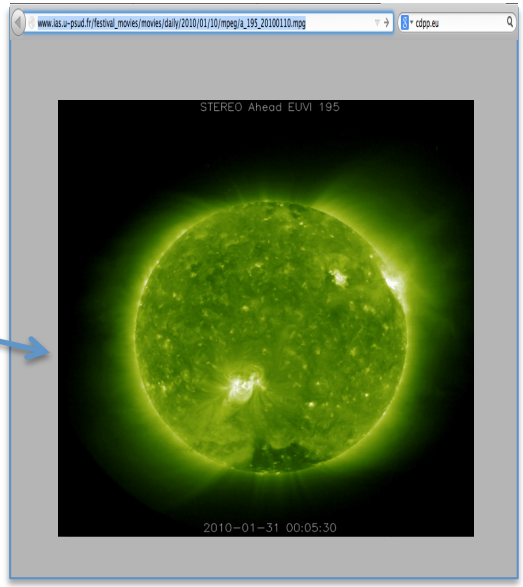


Radial Propagation | J-map: Carrington/InSitu
Corotation | J-map: Catalogue of fits
SEP Propagation | J-map: Click to fit

TARGET	t'	t'min (Δt)	t'max (Δt)	t'min (ΔV)	t'max (ΔV)	t'min (Δφ)	t'max (Δφ)	|φSTART(t)-φTARGET(t')|	r(T-S...	ΔφS...	φSpiral (sour...
		(hrs)	(hrs)	(hrs)	(hrs)	(hrs)	(hrs)	(°)	(AU)	(°)	(°)
SUN	2010-05-30T13...	0	0	0	0	-38.07	38.07	206.33	0	22.5	187.48
Probes											
MESSENGER	2010-06-05T11...	0	0	0	0	-38.07	38.07	37.21	0.4891	22.5	187.48
VEX	2010-06-27T02...	0	0	0	0	-38.07	38.07	16.43	0.7129	22.5	187.48
STEREO-A	2010-06-12T20...	0	0	0	0	-38.07	38.07	153.41	0.9519	22.5	187.48
WIND	2010-06-07T13...	0	0	0	0	-38.07	38.07	74.9	0.9984	22.5	187.48
ACE	2010-06-07T13...	0	0	0	0	-38.07	38.07	74.77	0.9999	22.5	187.48
STEREO-B	2010-06-02T09...	0	0	0	0	-38.07	38.07	0	1.0143	22.5	187.48
SOHO	2010-06-07T13...	0	0	0	0	-38.07	38.07	74.52	1.0004	22.5	187.48
MEX	2010-06-05T21...	0	0	0	0	-38.07	38.07	3.84	1.6412	22.5	187.48
CASSINI	2010-06-20T17...	0	0	0	0	-38.07	38.07	2.44	9.5123	22.5	187.48
Planets											
MERCURY	2010-06-10T21...	0	0	0	0	-38.07	38.07	173.39	0.4012	22.5	187.48
VENUS	2010-06-27T02...	0	0	0	0	-38.07	38.07	16.43	0.713	22.5	187.48
EARTH	2010-06-07T15...	0	0	0	0	-38.07	38.07	74.84	1.0095	22.5	187.48
MARS	2010-06-05T21...	0	0	0	0	-38.07	38.07	3.83	1.6412	22.5	187.48
JUPITER	2010-06-09T01...	0	0	0	0	-38.07	38.07	166.99	4.9668	22.5	187.48
SATURN	2010-06-20T17...	0	0	0	0	-38.07	38.07	2.47	9.5085	22.5	187.48
URANUS	2010-06-10T23...	0	0	0	0	-38.07	38.07	175.64	20.0...	22.5	187.48
NEPTUNE	2010-06-08T21...	0	0	0	0	-38.07	38.07	145	30.0...	22.5	187.48

Table of arrival times | J-map interface | Carrington Map
Fit parameters | Corotation Propagation Tool Interface | V plot at STEREO-B

AMDA plot at STEREO-B at t

The link to the French plasma (CDPP) and solar image (MEDOC) data centers is via web-service:

- In situ datasets are accessed in a fixed format via AMDA (CDPP data mining tool),
- Solar (daily) movies are launched in your browser via the MEDOC data center