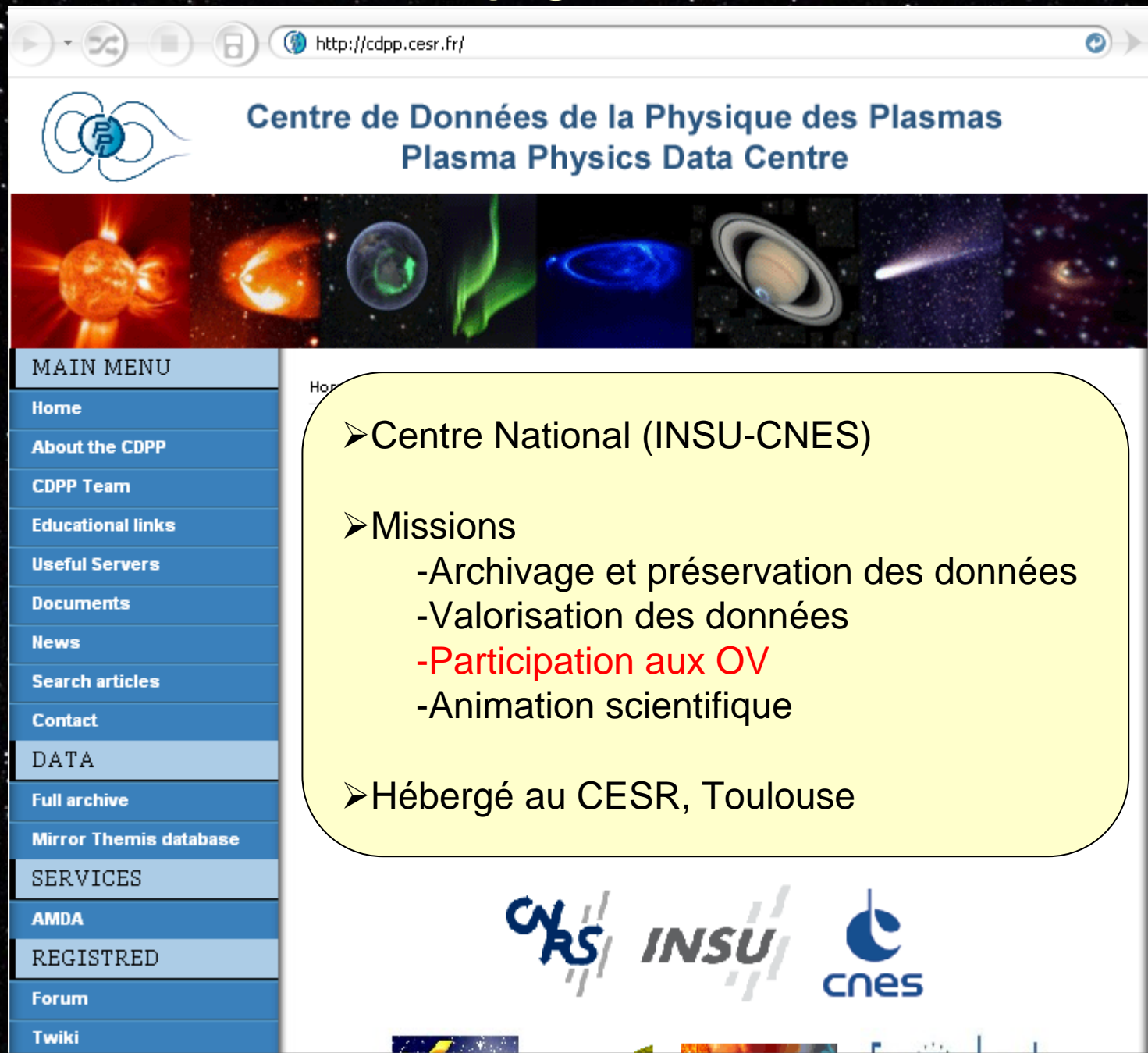


CDPP in Europlanet/IDIS FP6 and FP7

C. Jacquey, N. André, B. Cecconi, V. Génot, C. Briand

M. Gangloff, M. Bouchemit, E. Budnik, E. Pallier

Le CDPP

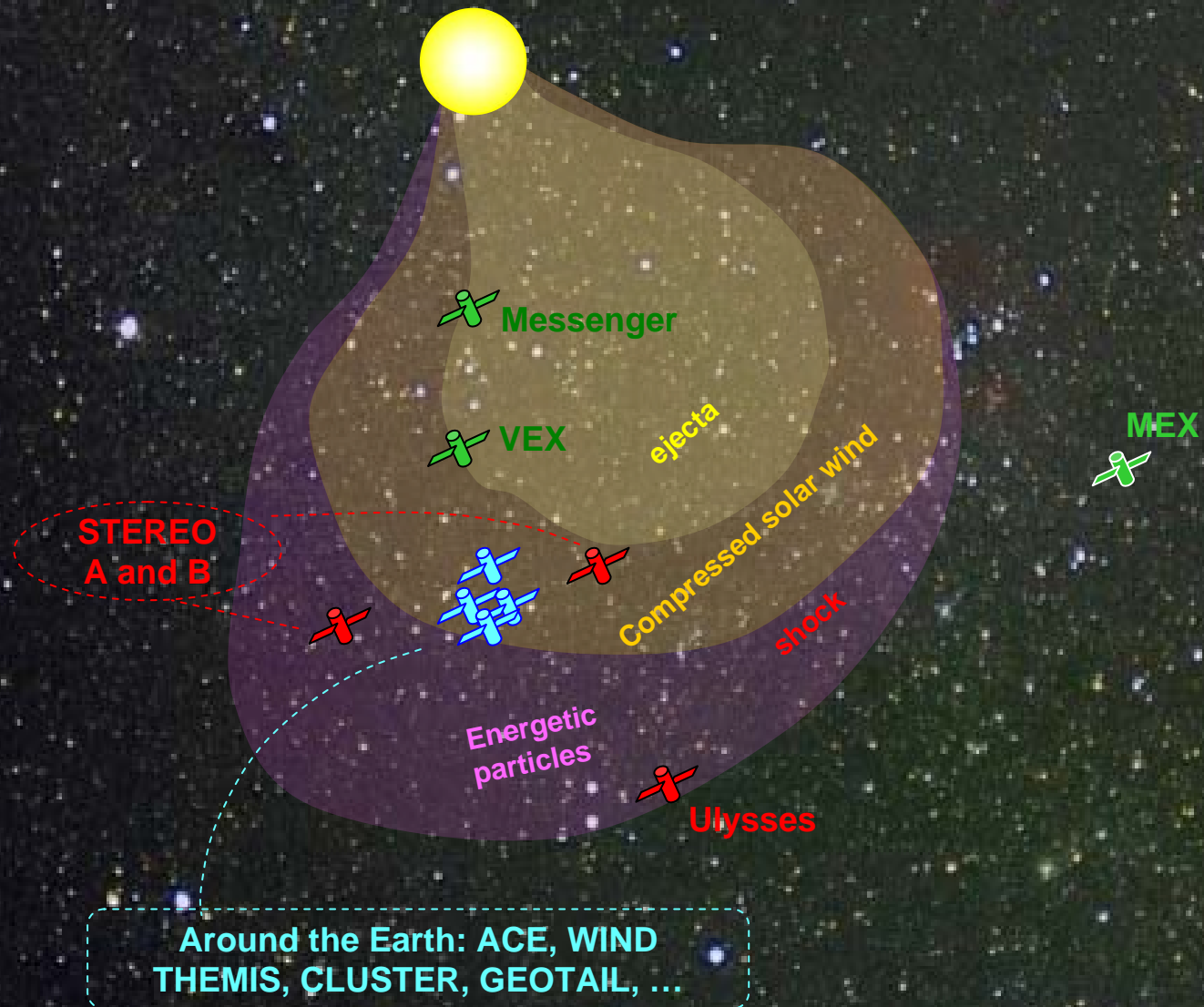


The screenshot shows the CDPP website. At the top is a browser window with the address <http://cdpp.cesr.fr/>. Below the browser is the website header with the CDPP logo (a stylized 'F' inside a circle with magnetic field lines) and the text "Centre de Données de la Physique des Plasmas" and "Plasma Physics Data Centre". A horizontal banner below the header contains a series of images: a solar flare, a comet, a planet with a ring, and various plasma phenomena. On the left is a vertical navigation menu with the following items: MAIN MENU, Home, About the CDPP, CDPP Team, Educational links, Useful Servers, Documents, News, Search articles, Contact, DATA, Full archive, Mirror Themis database, SERVICES, AMDA, REGISTRED, Forum, and Twiki. The central content area has a yellow background and contains the following text:

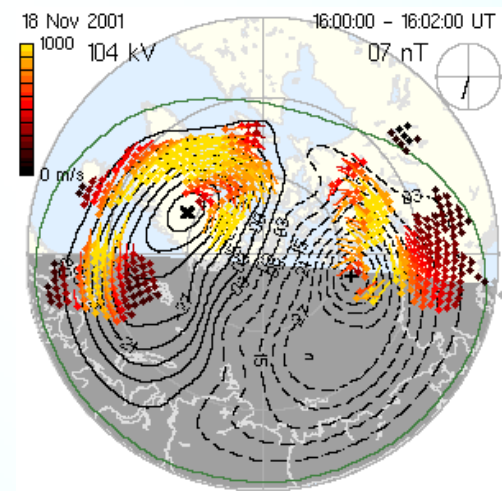
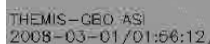
- Centre National (INSU-CNES)
- Missions
 - Archivage et préservation des données
 - Valorisation des données
 - Participation aux OV
 - Animation scientifique
- Hébergé au CESR, Toulouse

At the bottom of the page, there are logos for CNRS, INSU, and CNES.

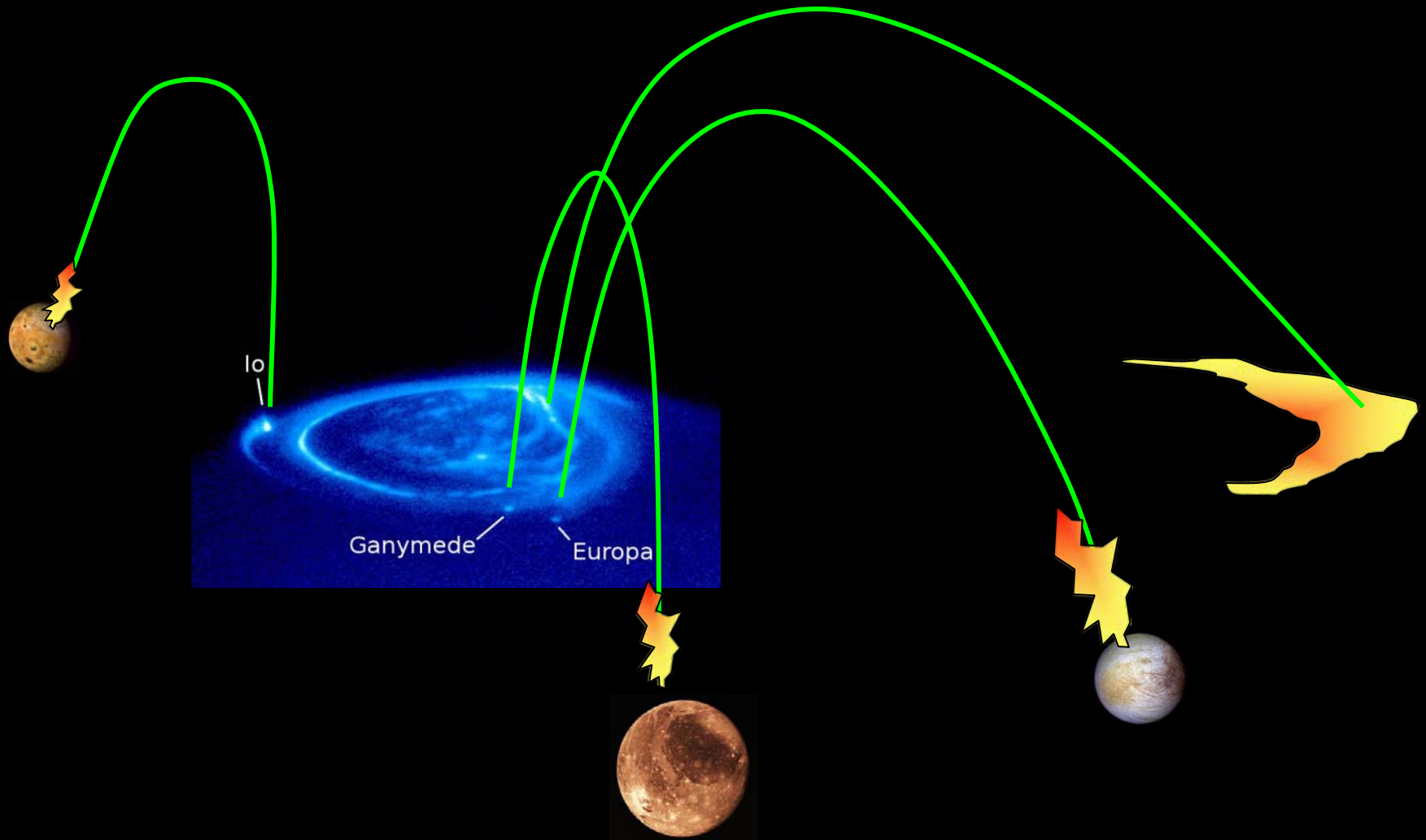
August 15, 2007



Ex.: Prangé et al., Nature, 2004



Challenges of a VO of planetology (1)



Type de données

- Le temps (datation des mesures) est le premier paramètre de recherche et d'identification des données :

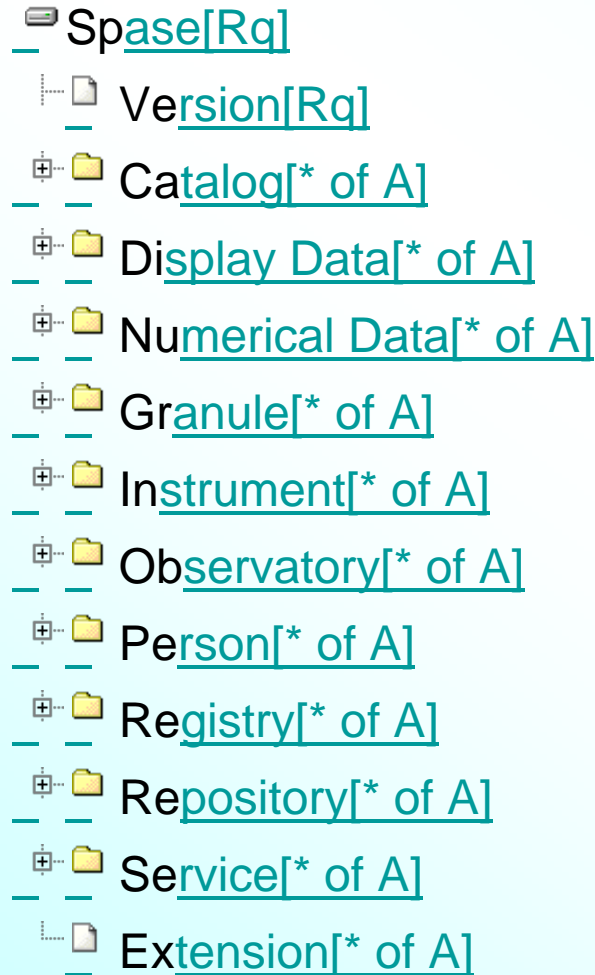
Time span \Leftrightarrow Search cone

- Données:

1. Images (datées), films
2. Série temporelles, 1D, 2D, 3D, Nx3D
3. Paramètres combinés
4. Données de simulation

- Standard: SPASE : modèle de données structuré

SPASE



Consortium international:

- Définition des standards
- Offre d'outils

Le modèle SPASE

- Modèle structuré « dépliant »
- Associé à un dictionnaire spécifique aux plasmas spatiaux
- Accepte des « extensions »
- Descend jusqu'aux niveaux « granule » et « paramètre »

CDPP in EuroPLANET/FP6

CDPP in EuroPLANET/FP6

- Co-leader (avec IWF, Graz) du Noeud Plasma d'Europlanet/IDIS
- Analyse de cas d'utilisation, définition des spécifications de l'OV à développer (User Requirements)
- mini VO demonstrator
 - Searchable registry demonstrator based on SPASE
 - AMDA/IDIS: Scientific exploitation demonstrator using VO concepts and technics
- 3DView Multi-Mission: a tool for spacecraft location and attitude in the solar system and around the planets to be interoperable

Goals:

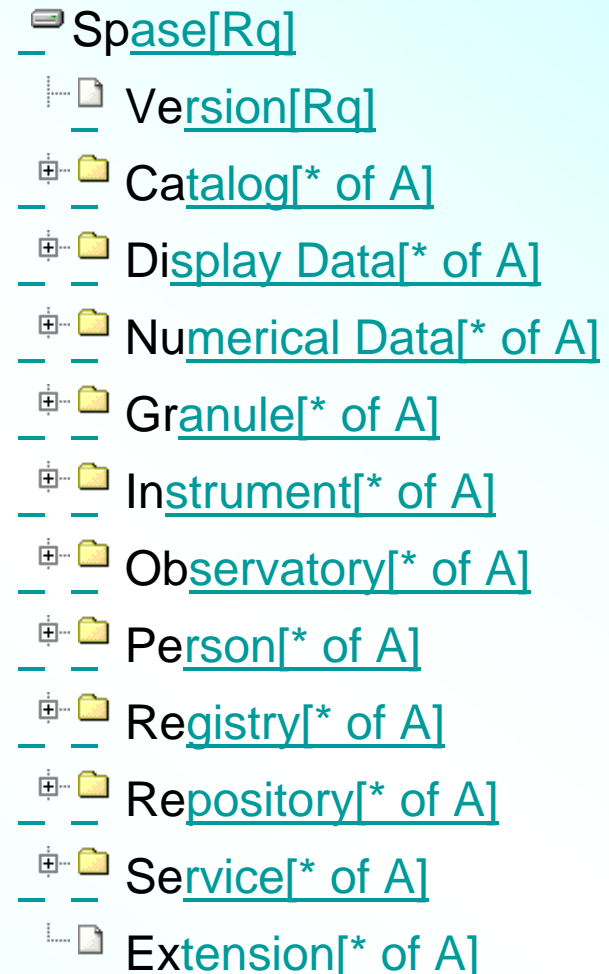
- Experiment for data description in VO context
- Experiment for data access in VO context
- Experiment for VO architecture
- Experiment for data exploitation in VO context

Registry demonstrator

SPASE (Space Physics Archive Search and Extract)

<http://www.spase-group.org/>

- A datamodel (a way –standardised and structured- for describing data)
- A dictionary for solar and space physics data
- Tools (generator, editor, validator of descriptors, harvester, parser, ...)



Web-services on MAPSKP

MAPSKP: database of key-parameters of CASSINI plasma data (<http://mapskp.cesr.fr/>)

Descriptors of all MAPSKP dataset

- compliant to the SPASE datamodel (v 1.2.1)
- Managed in an eXist database

Web-services:

- get available data
- Get DataSet Info URL
- Get DataSet URLs
- Update Start/Stop

Searchable Registry Demonstrator

- Set of XML descriptors of planetary plasma data (MAPSKP, *VEX*, *MEX*)
- Compliant with the SPASE data model (v 1.2.1)
- eXist database (native XML, parameter level)
- Search engine (measurement type, region)
- Goals: demonstration and experimentation

Registry Search Engine

(<http://cdpp-spase.cesr.fr:8800/exist-1.1.1/xquery/PlasmaNodeRegistry.xql>)

- Search criteria:
 - Time span
 - Measurement type
 - Observed region
 - Resource type (numerical data , display data or catalog)
- Response:
 - Spase Xml descriptor
 - Possibility to use XSL style sheet to customize presentation

Plasma Node Registry Demonstrator: Get an XML Descriptor compliant with the SPASE Data Model

Any Element contains:

cassini

Start Time (YYYY-MM-DDThh:mm:ss) :

1990-01-01T00:00:00

End Time (YYYY-MM-DDThh:mm:ss) :

2010-01-01T00:00:00

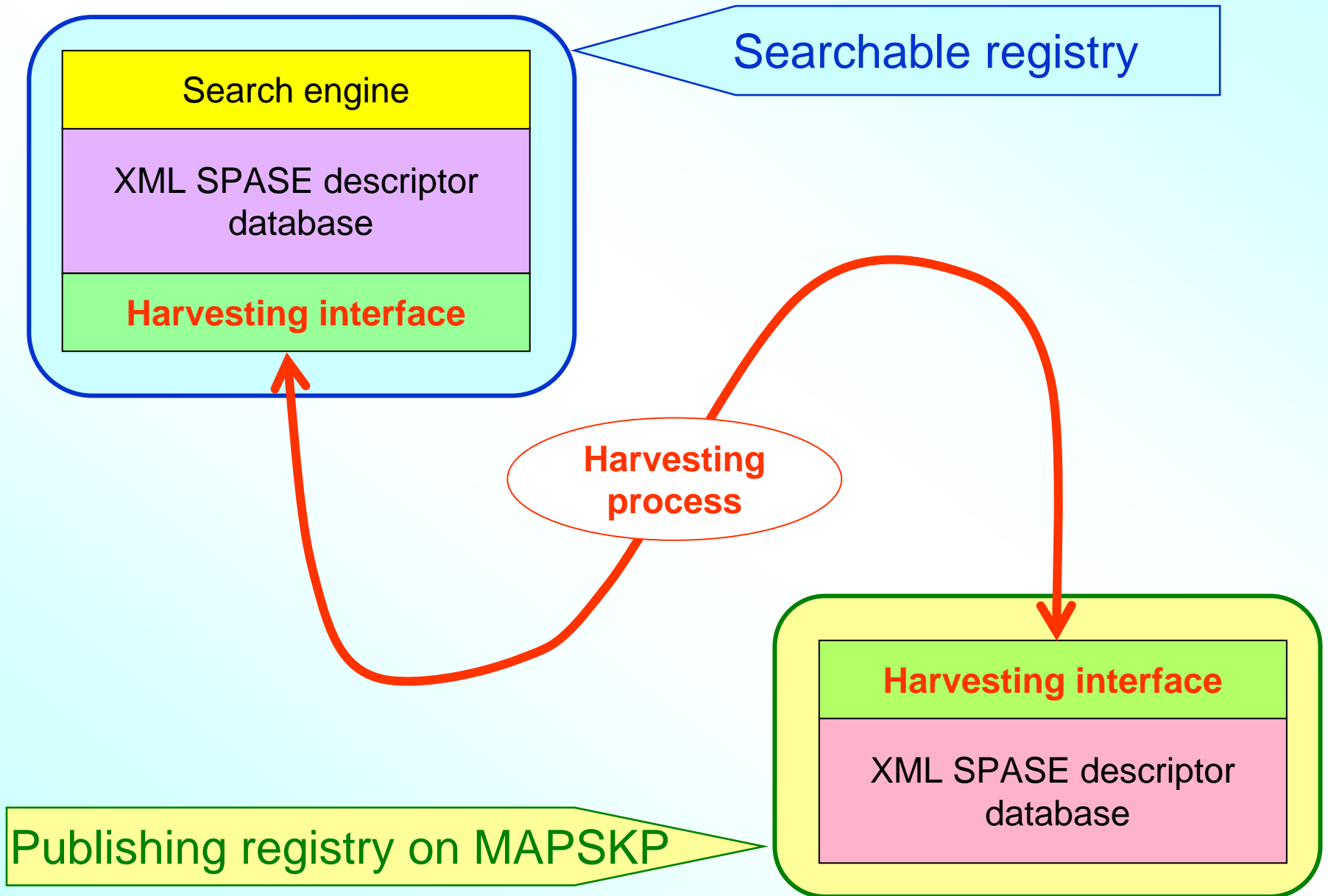
Resource Type: ☐ All ☐ Catalog ☐ Display Data ☒ Numerical Data

Measurement Type: Radio and Plasma Waves ▼

Observed Region: Saturn ▼

get SPASE descriptor

Next step: a VO type architecture



Registry demonstrator

Science exploitation demonstrator:

AMDA, Automated Multi-Dataset Analysis

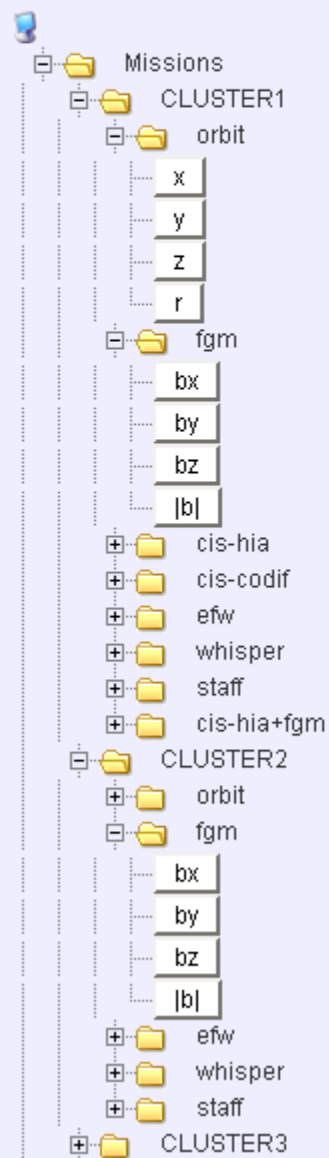
(<http://cdpp-amda.cesr.fr>)

- *Automated access to data*
- *Dealing with parameters, without caring about files*
- *Multi-spacecraft and multi-instrument data*
- Functionalities
 - Visualisation
 - user defined parameter computation
 - Standard model computation
 - Data and computed parameter extraction
 - Event list production and management
- Automated or visual search on the content of the data
- Access to **external databases** (now: CDAWeb, CDPP, MAPSKP, SKR, VEX-MAG, HST, ...)

Conditional search

Select parameters to compose the condition

open all | close all



Construct Your Search Condition:

```
b_c1(0)*b_c2(0)*b_c3(0)*b_c4(0)>0 &  
xyz_c1(0)<-10 & min([b_c1(0), b_c2(0),  
b_c3(0), b_c4(0)])<0 & max([b_c1(0), b_c2(0),  
b_c3(0), b_c4(0)])>0
```

Syntax of Condition expression

arithmetic operators: + - * / ^

brackets: () , []

functions: sin() cos() sqrt() atan() a

relational operators: > , <

logical operators: & , |

Example

$\sin(\text{param1}) > 0 \ \& \ \text{param2} < 0$

Averaging/Interpolation

Sampling time step

60 secs

Treat data absence as gap

Time interval greater than

5 × data sampling
time

Start Time

Year / Mon / Day Hour : Min : Sec

2002 / 08 / 01 02 : 00 :
00

Time Interval

Day / Hour : Min : Sec

030 / 00 : 00 :
00

Reset

Generate Table demo_CLWksp

Save Condition

search

Generate Table From SearchTable

Load Condition

Visual search

http://manunja.cesr.fr - AMDA - Mozilla Firefox

StartTime

StopTime

2005/8/26 12:28:44

2005/8/26 14:45:38

Add Time Interval To

demo_CL_WkShp

Select Table from List

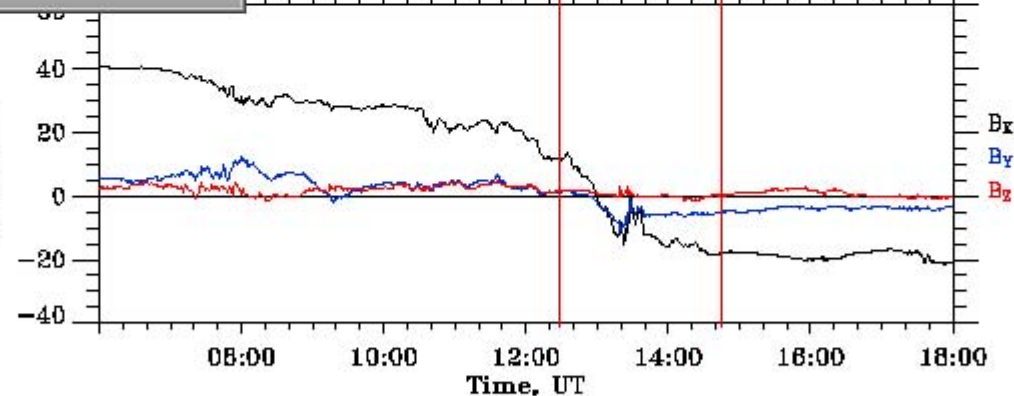
SearchTable

Reset

DONE

Terminé

C1_FGM
B GSE, DT



Aug 26 2005

Created by DD_SYSTEM(C) 6.0 Wed Mar 12 11:29:55 2008

Save Start-Stop

Zoom

Back

1/2 Back

1/2 Next

Next

DONE

Terminé

Access to distant data

Welcome to AMDA - Mozilla Firefox

Fichier Édition Affichage Historique Marqués pages Fenêtres Outils

http://cdpp-amda2.cesr.fr/DDHTML/HTML/loginreq.php

Google fouquet latt Rechercher Recherche en France Mes favoris PageRank Traduire Envoyer à

site web CDPP - Home

Welcome to AMDA

Help

Feedback

Logout

My Parameters

My Time Tables

Plot Data

Download Data

Conditional Search

External Data

External Tree

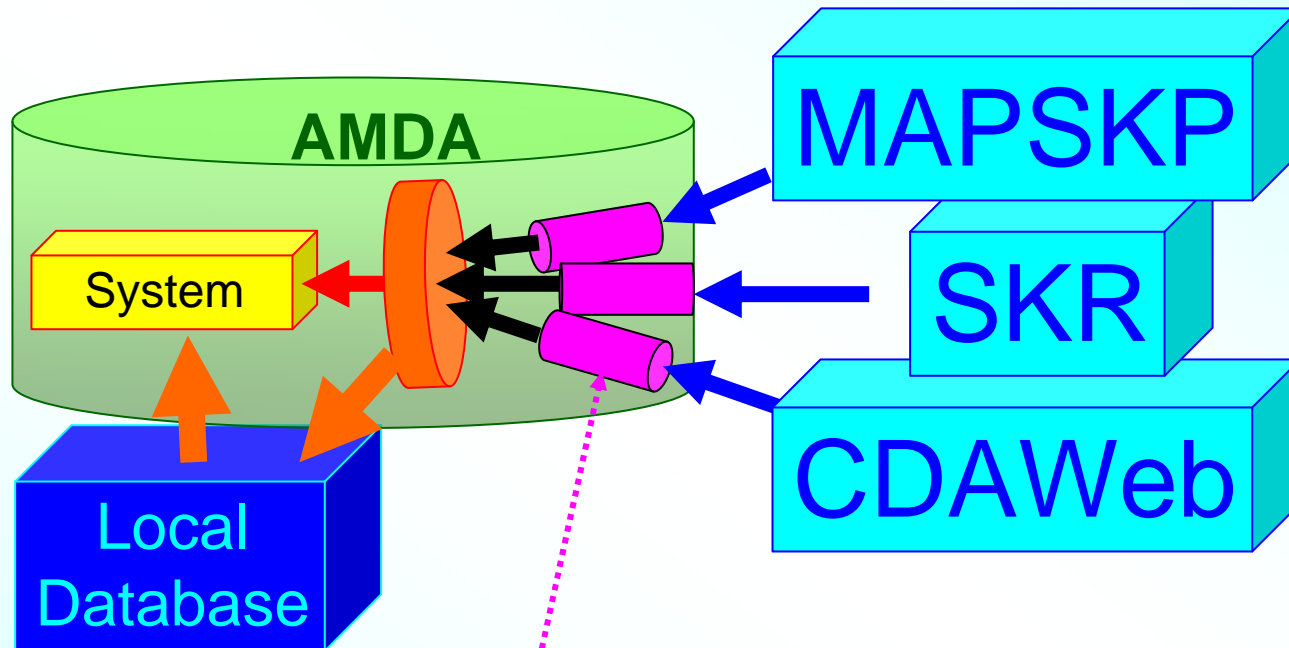
- ☐ close all ☐ open all
- ☐ CDAWEB
- ☐ CDPP
- ☐ MAPSKP
 - ☐ Cassini
 - ☐ TRAJ
 - ☐ INMS
 - ☐ CAPS
 - ☐ MAG
 - ☐ CDA
 - ☐ RPWS
 - ☐ MIMI

My Tree

save tree

- ☐ close all ☐ open all
- ☐ CDAWEB
- ☐ MAPSKP
 - ☐ Cassini
 - ☐ MAG
 - ☐ MAG_KSM
 - ☐ VECTOR
 - MAGNITUDE

AMDA/IDIS V1.

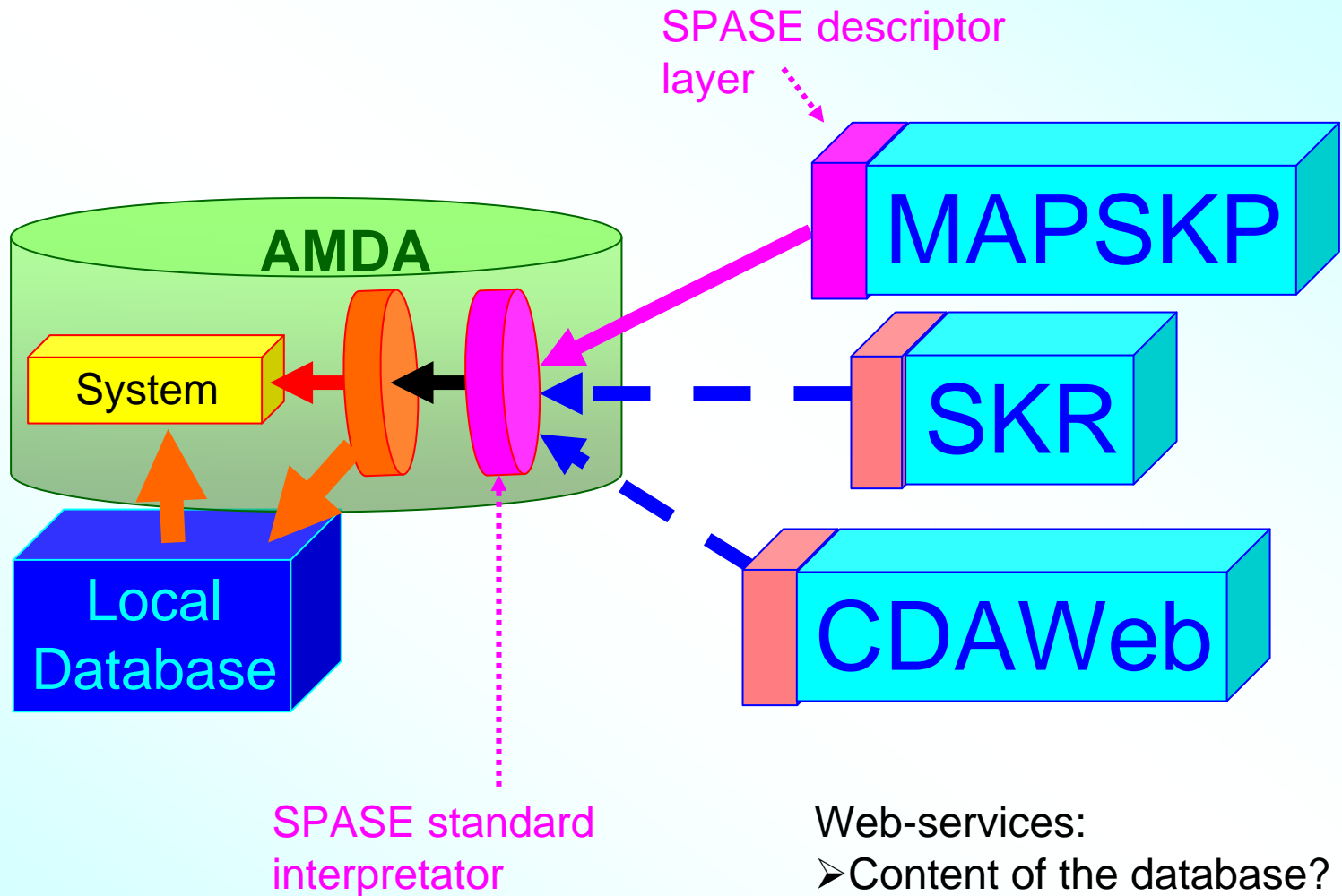


Specific
interpretator

Web-services:

- Content of the database?
- Get the descriptors
- Get data (url list)

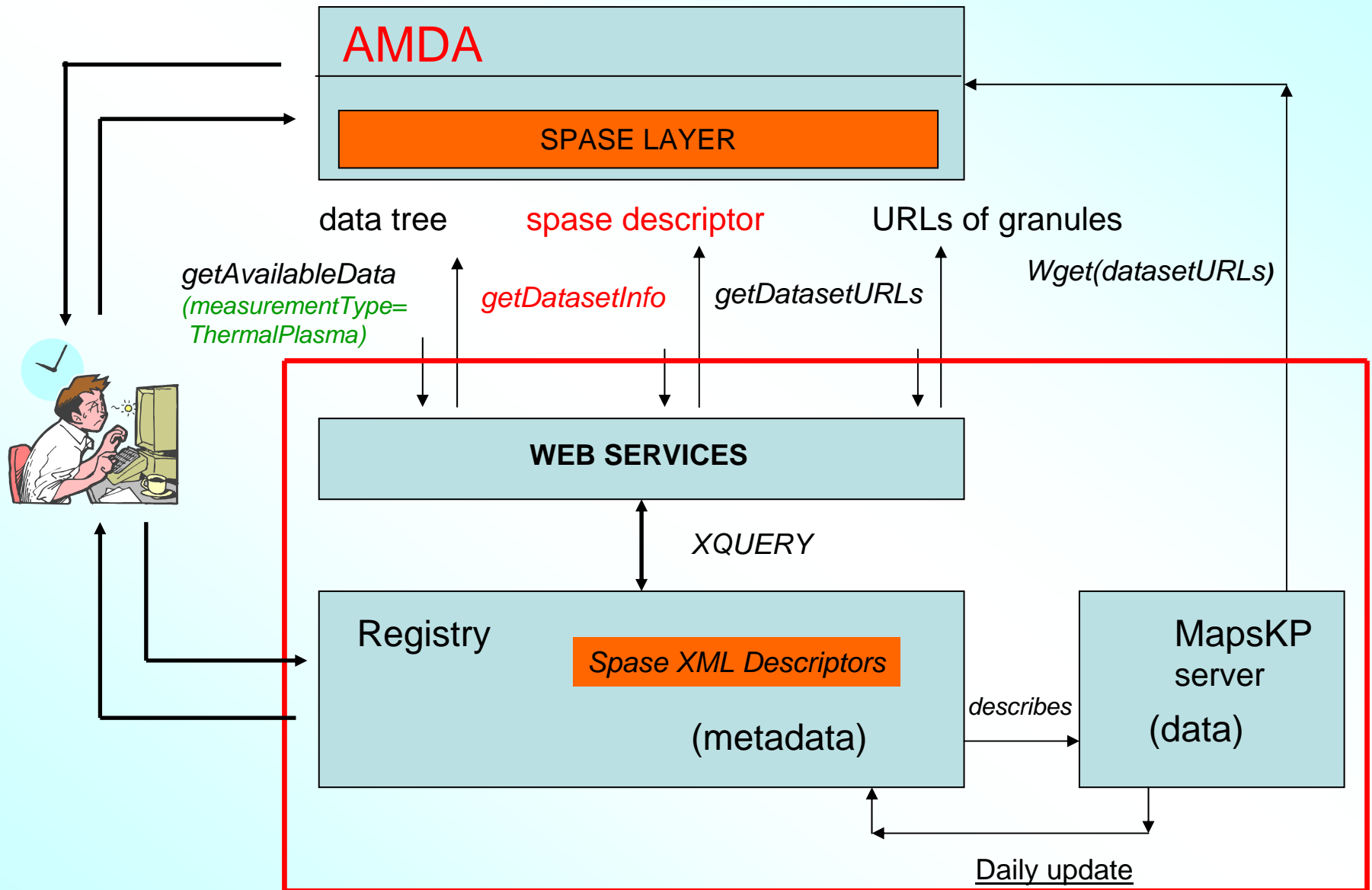
AMDA/IDIS V2. SPASE compliant



Web-services:

- Content of the database?
- Get the descriptors
- Get data (url list)

AMDA/IDIS EuroPlaNet/Plasmas



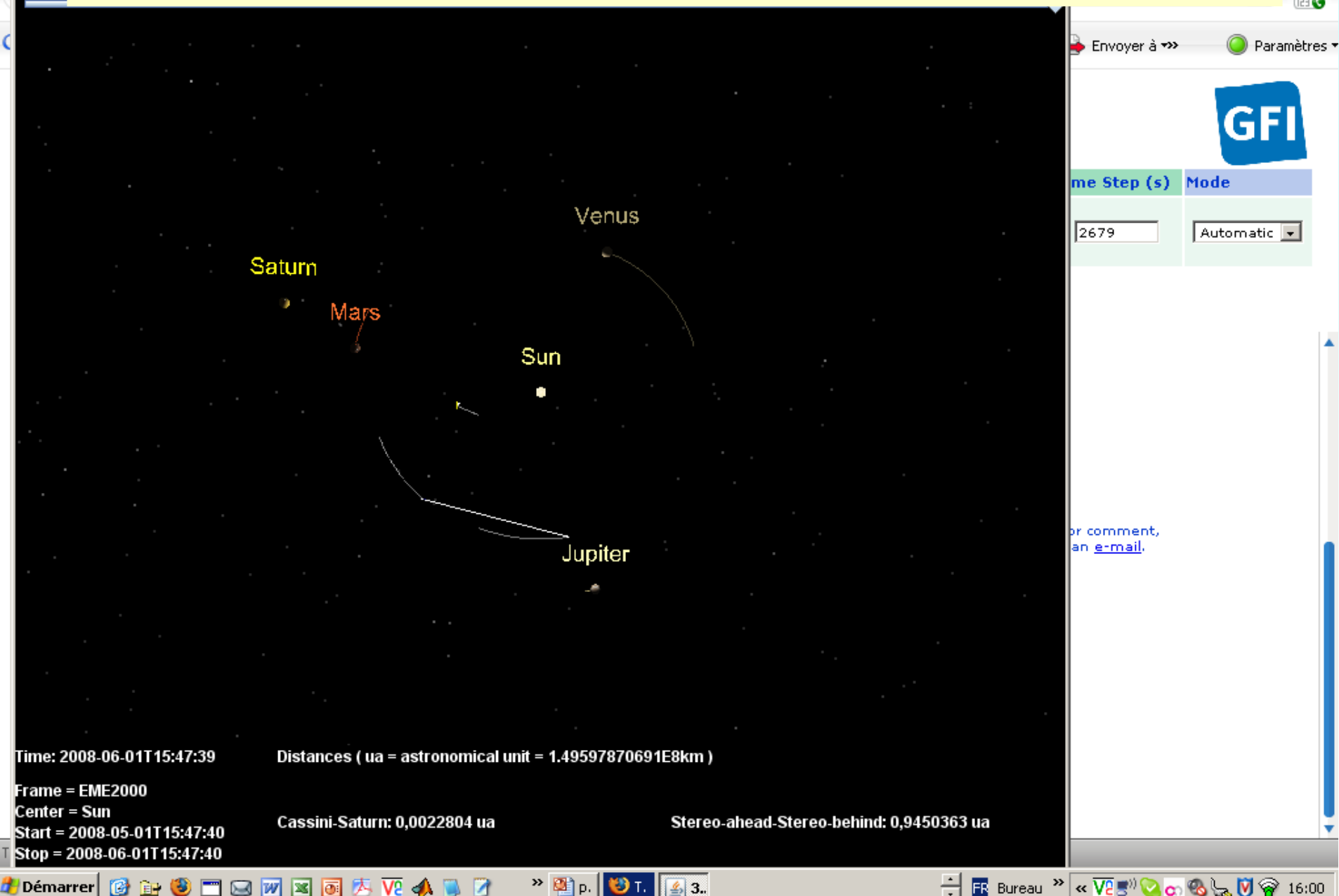


3DView Multimission

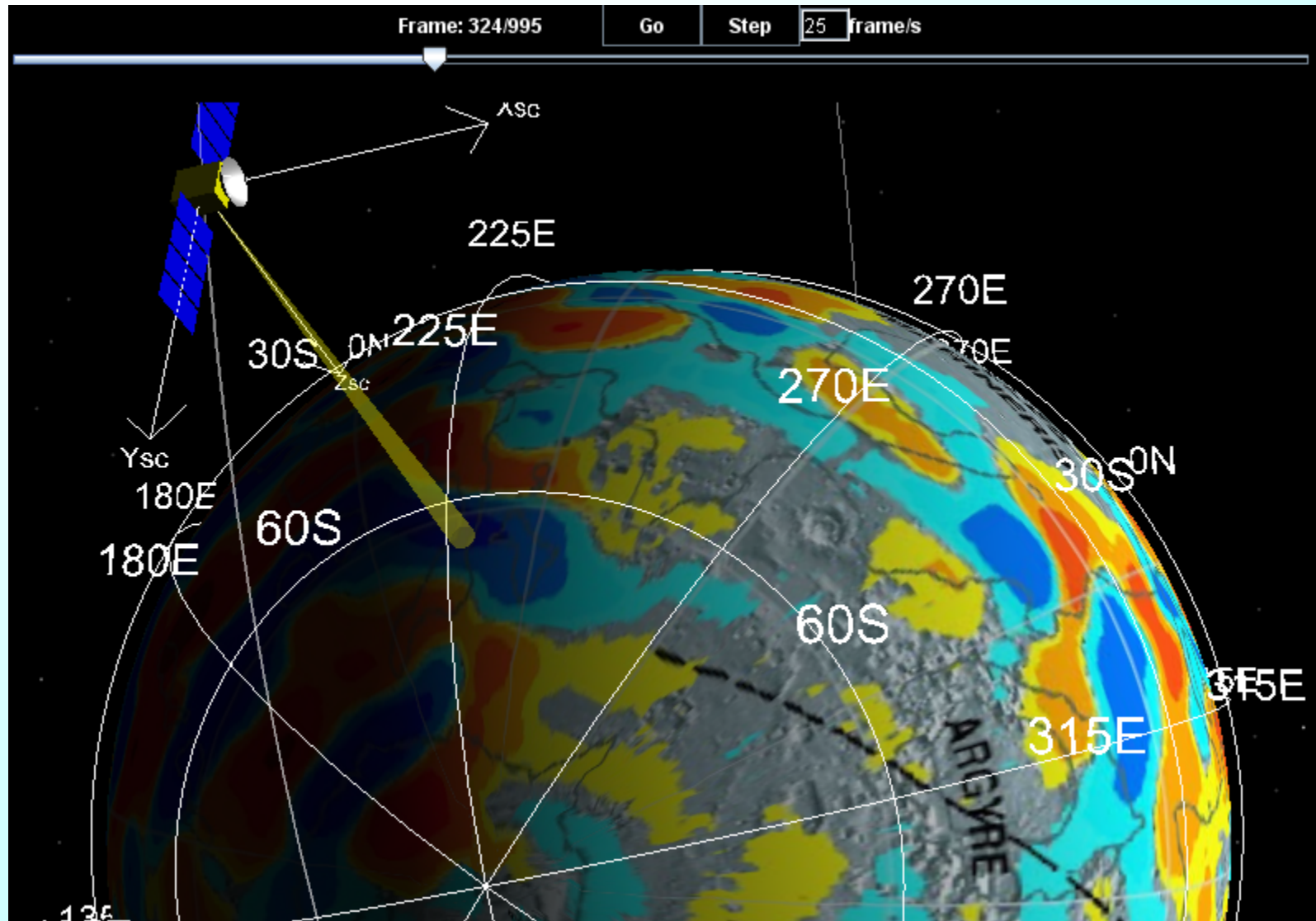


<http://mm3dview.dyndns.org/>

3DView-multimission/ Heliophysics



3DView-multimission: Planetology



CDPP in EuroPLANET/FP7

CDPP in EuroPLANET/FP7

Recherche (responsable tâche-2 JRA/IDIS):

- Définition du modèle de données », jusqu'au niveau « jeu » (Level 1)
 - Analyse des standards existants versus cas d'utilisation
 - Développement de prototypes et test sur cas d'utilisation
 - Développement d'outils « DataModel, Registry, Harvesting, ... »
- Développement d'interfaces
 - autres OV (HELIO, IVOA, SPASE-US...)
 - Bases de Données « externes » (Spectro, Chimie...)
- Searchable registry et searchable inventory

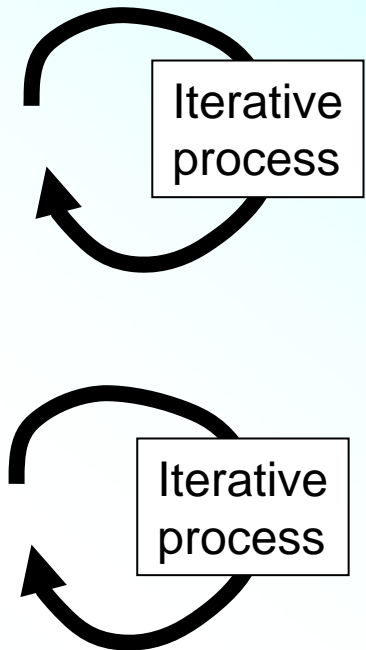
Services:

- Co-leader (avec IWF, Graz) du Noeud Plasma d'Europlanet/IDIS
- Mise à disposition des outils « DataModel, Registry, Harvesting, ... »
- AMDA/IDIS
- 3DView/Interopérable

Diffuser et développer la culture OV dans la planétologie au niveau européen

FP7, JRA: Datamodel, process

- 1) Analysis of the user requirements (Hierarchy ???)
- 2) Study of the existing standards (IVOA, SPASE)
- 3) Preliminary options
- 4) Datamodel prototype development
- 5) Datamodel prototype testing versus use cases
- 6) Assessment/improvement
- 7) Stabilising temporary version
- 8) Developing tools (data description, verifier, registry building, harvesting, request builder...)
- 9) VO-prototype development
- 10) VO-prototype testing
- 11) Assessment/improvement
- 12) Stabilising temporary version



Continuous interaction with PSA and IPDA

Interface with other Vos and « external » database

V0s on Solar Physics, Heliophysics, Astronomy

« External » databases: spectroscopy, chemistry, ...

- Up to the dataset (measurement type) level
- Only possible if external resources use well defined standards
- The target will be limited. It is a secondary objective. Keys of priority relate to scientific needs and level of interoperability of external resources

Post-Doc

- Performing pluri-disciplinary studies \Rightarrow performing real use case
- Analysing their needs
- Participating in datamodel and dictionary definition
- Testing the datamodel and the built system against their needs in their studies
- Interacting with the community and getting feedback and inputs
- Promoting IDIS, hopefully through papers

Roles of the scientists

- Participating in datamodel and dictionary definition
- Interacting with the community and getting feedback and inputs
- Promoting IDIS, hopefully through papers

Anticipated participants

- Core team: CDPP, INAF, IWF, others?...
- “to be solicited” support: ESTEC, CNES
- Strong collaboration with ESAC/PSA expected
- Strong collaboration with other tasks expected

Targeted expert solicitation:

- Collaborations (Bepi-Rosetta): DLR, MPS (OSIRIS), INAF (SYMBOL-X), Heidelberg (dust)
- Collaborations GIOTTO: PSA, CDPP/CESR, ...
- Ground observations (LAM database, ...)
- Others...

- Continuous interaction with IPDA