

The CDPP-CESR proposal for the plasma node of Europlanet

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What does Europlanet want to do in FP7?

A European Virtual Observatory for planetology?

➤ Help for accessing and exploiting planetary data by
thematics ⇒ thematic nodes

➤ Connection with other planetary VO?

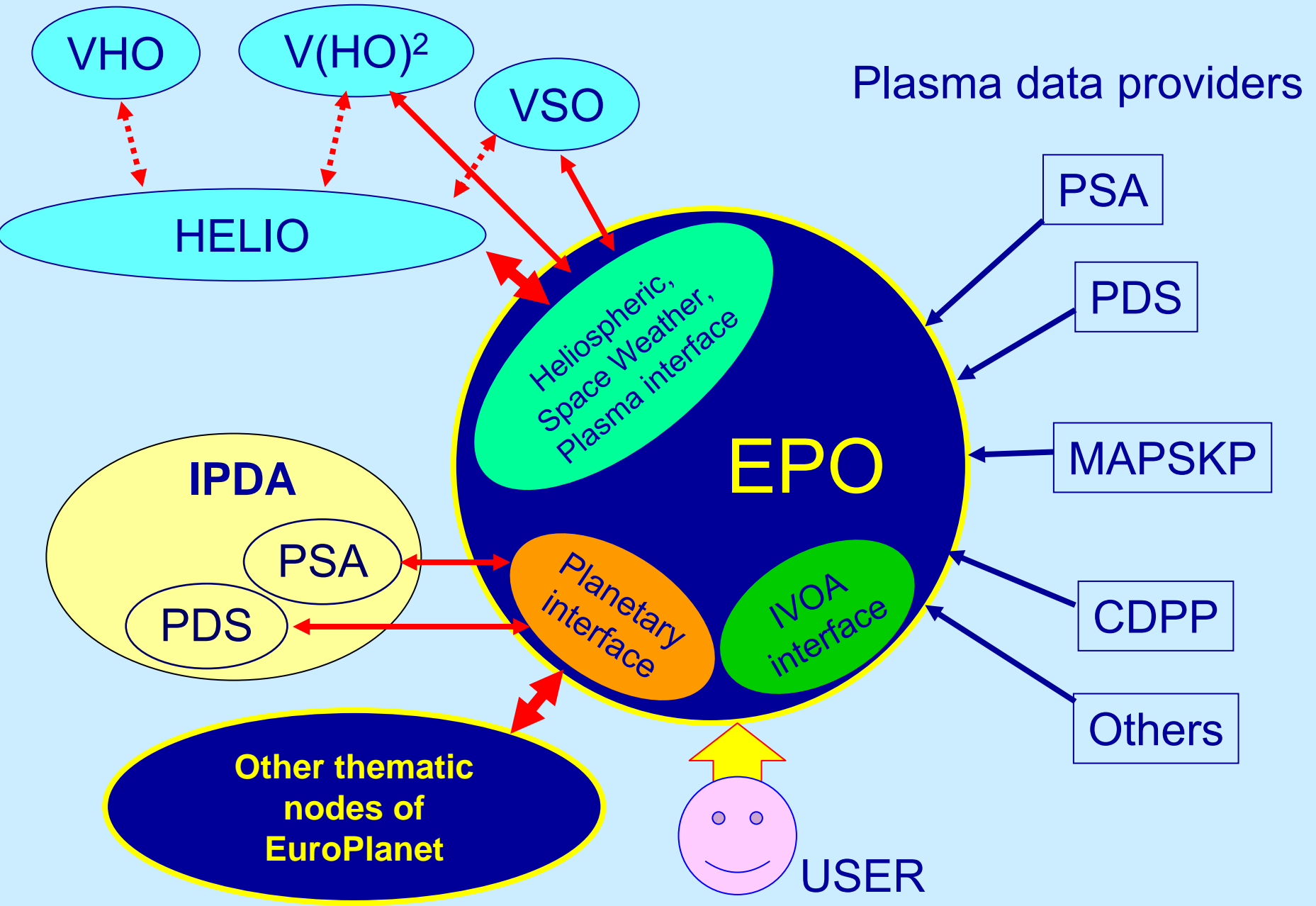
➤ Connection with other planetary thematics?

Toward pluridisciplinnary, global study of the planetary objects?

➤ Connection with non-planetary thematics?



Europlanet Plasma Node (2010-2011)?



What does Europlanet want to do in FP6?

- (1) Inventory of the resources (until what level?)
- (2) Identifying user requirements and scientific specifications
- (3) From them, recommending specifications on:
 - Data description
 - Architecture
 - Services
 - Data exchange
 - Data exploitation
- ▶ Method:
 - use case analysis, “algorithmics”
 - analysis of the existing data system and norms ?
- ▶ Final product: reference document, basis for the FP7 proposal
- (4) Build a demonstrator
- **Preparing the FP7 Europlanet project**

(1) Resource Inventory

(1a) the E. Palier/CESR inventory

➤ For which use? Until which level of detail, i.e., complexity?

(1b) a true registry, including functionalities as “search engine”

➤ Example: Virtual Space Physics Observatory (NASA)
<http://vspo.gsfc.nasa.gov/websearch/dispatcher>

⇒ Requires a norm for resource description, i.e.,
a data model + a dictionary

➤ Demonstrator #1 for plasma node, based on SPASE

- (2) Identifying user requirements and scientific specifications
- (3) From them, recommending technical specifications

The tools:

- Use/Science Cases
- Existing system and norms: SPASE (plasma node)

Use/Science cases:

- Case studies
- Statistical/systematical studies
- Comparative studies
- Heliophysics studies
- Global planetary studies

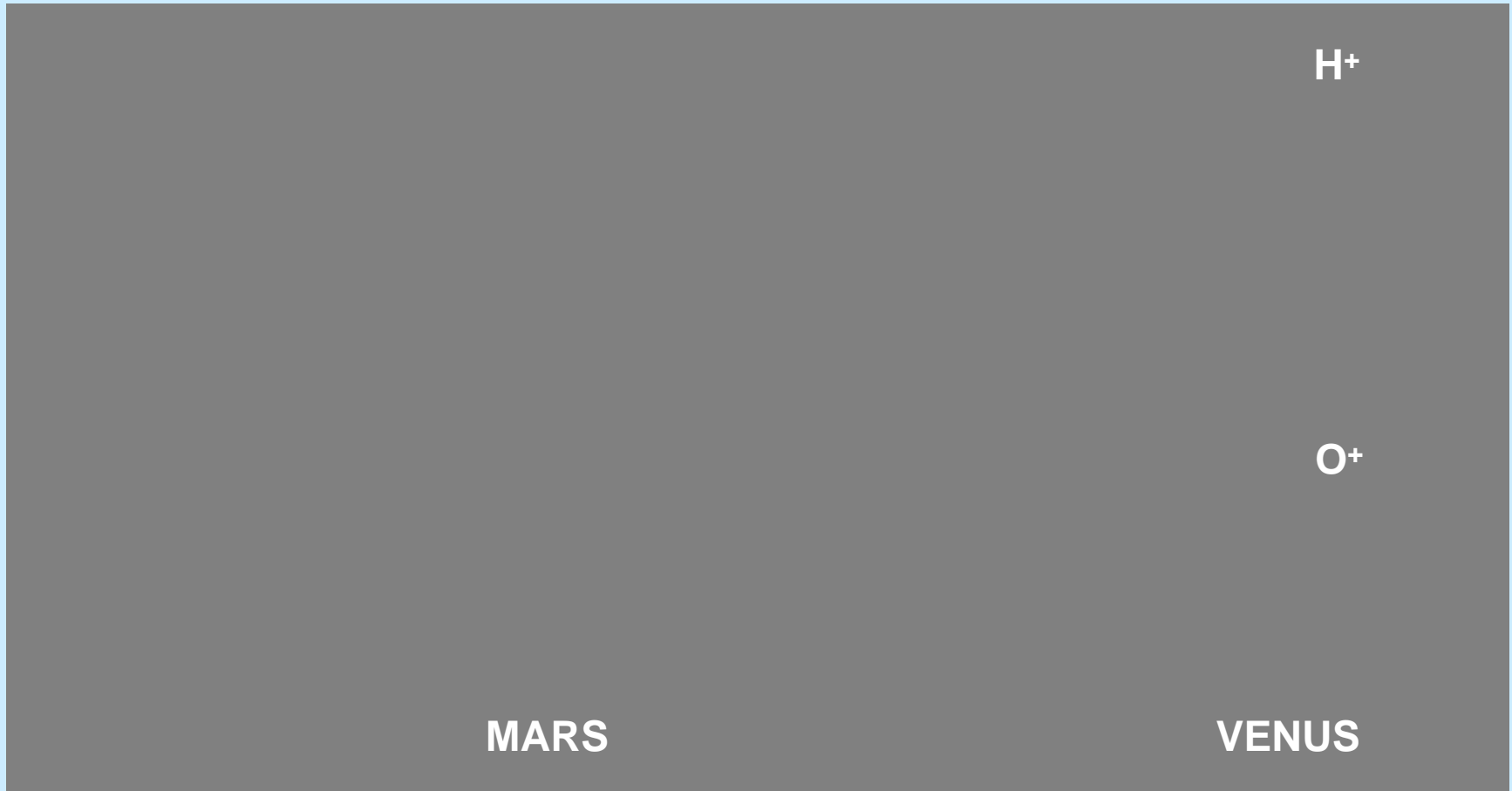
Fields:

- ▶ Plasmas
- ▶ Neutral (atmosphere, exosphere, other..)
- ▶ Dust
- ▶ Rings
- ▶ Small bodies
- ▶ Planetary surface, volcanism, ...
- ▶ ...

Planetary studies can be fed by any combination of these fields declined in any of these study types

The main need is not technical but scientific

Comparative planetary studies

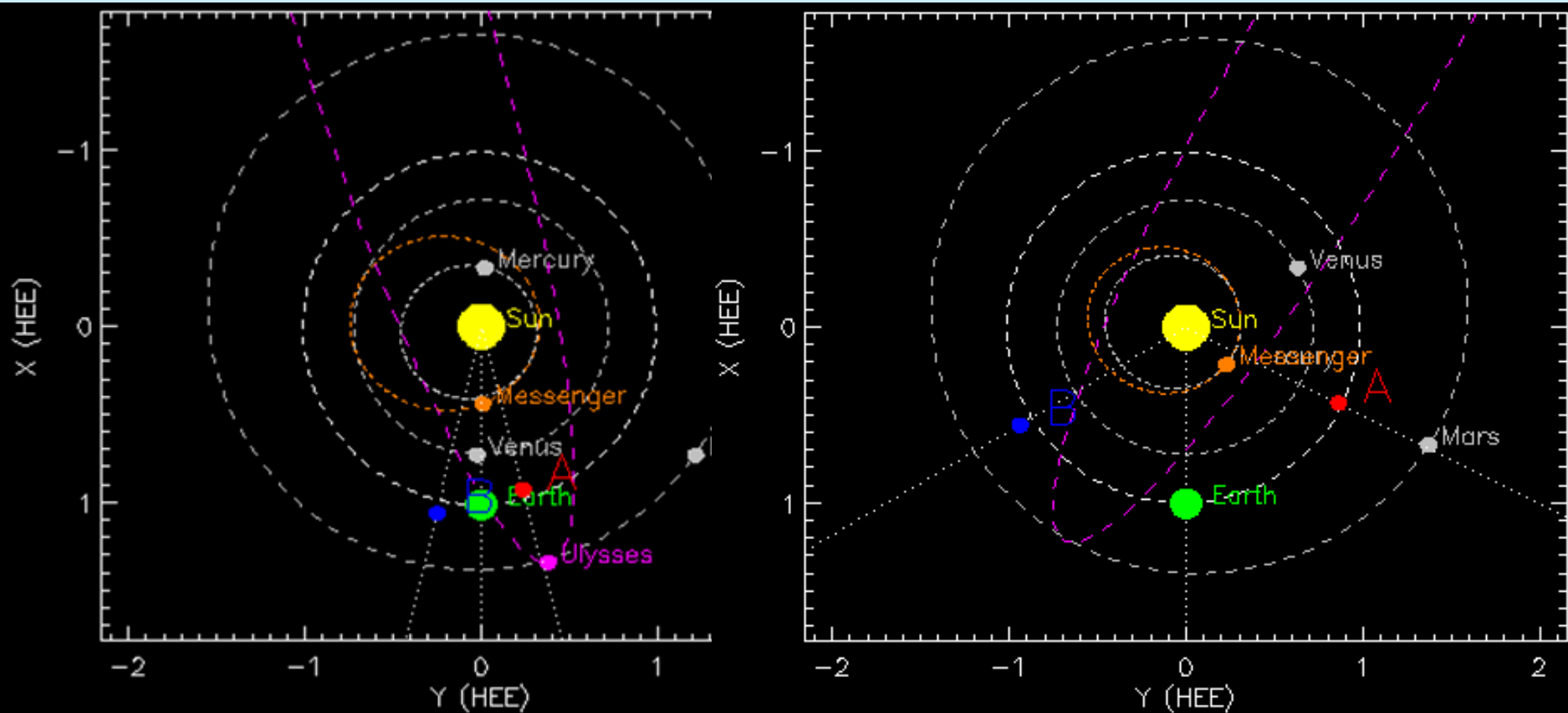


Ferrier et al.

- Normalizing tools
- Models

- Space weather input
- Instrumental comparison

Heliophysics studies



Connection to HELIO (FP7 proposal)

Global planetary studies

Who knows a little about that?

Who has an idea of the way to follow?

Who has a scientific expertise on that?

How to translate that in technical specifications?



Plasma/rings interaction, Io heavy ions injection and subsequent instabilities, Sodium ion escape and substorms at Mercury, Mercury surface erosion due to plasma, ...

This is the big challenge !

(4) Building a demonstrator

- Provide prototype demonstrating functional solutions which fit the scientific specifications and user requirements
 - First step: identifying, locating, accessing and extracting data targeted by the user
 - Second step: integrating services allowing data scientific exploitation, support to the data interpretation
- Provide prototype which show the interest of IDIS to the community

The proposal of CDPP for FP6

(as the leading institute of the plasma node)

Initial proposal: (cost ~10 kE)

- (I) Realise a demonstrator (demonstrator #2) based on local and non-local database and the service AMDA for illustrating the interest of an integrated data system
- (II) Animation of a working group for data description study
 - for extending the SPASE norm to planetary plasma data, in coordination with the SPASE consortium and IPDA (International Planetary Data Alliance)
 - For diffusing its competence and experience in VO and interoperability

Additional tasks proposed at the current time: (cost > 20 kE, min.)

- (III) Scientific specification for the plasma node (Use Case Analysis)
- (IV) Technical recommendations in coordination with the top-node
- (V) Demonstrator (demonstrator #1) of a registry including “search engine”, “on the flight data extraction”

(I) Demonstrator #2

AMDA: Automated Multi-Dataset Analysis

cdpp_amda.cesr.fr

- Tool developed at CDPP

- Automated access to data from local or *external database*

- User defined computation/visualisation on the content of the data

- Automated or semi-automated search on the data content

- Web-service integration

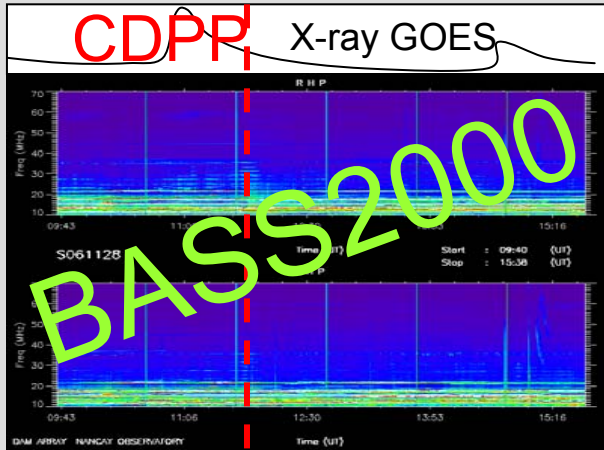
Constrain: database needs to implement interface for data feeding

Demo

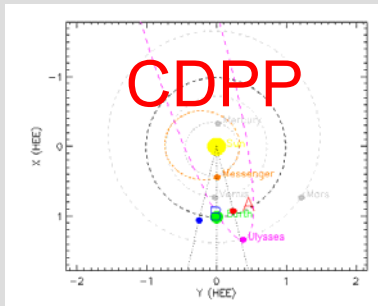
Project for FP6: integration of planetary plasma data

Project for FP7: tools for comparative studies, integration of non plasma data

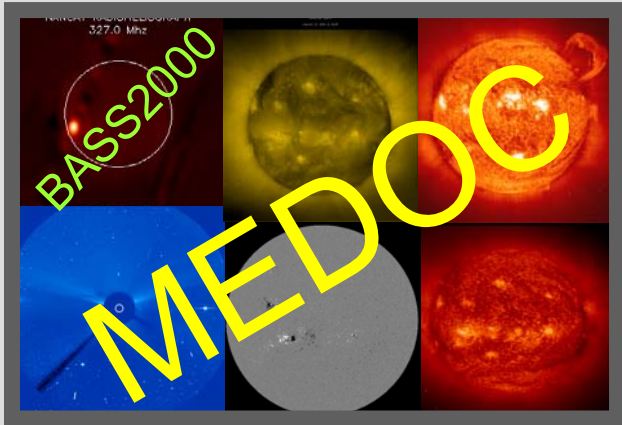
General functions



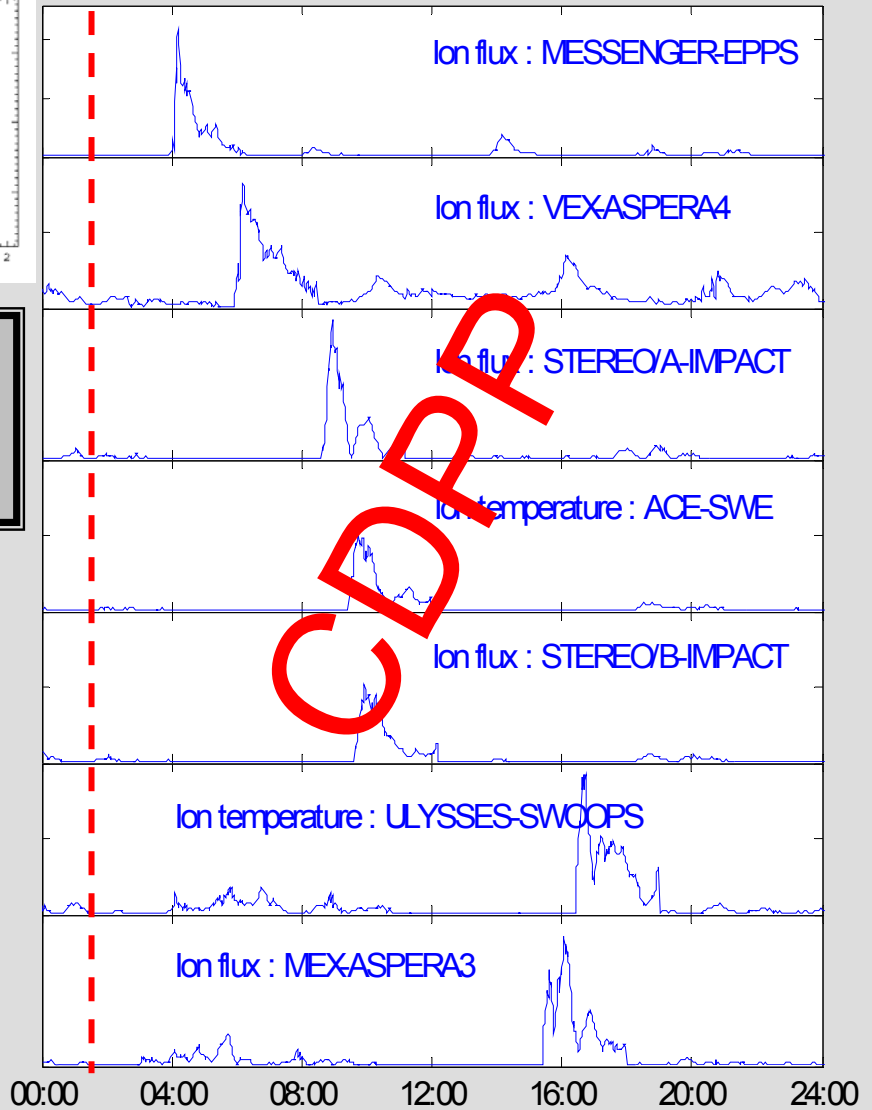
SOL/tools



Time tools



PLAS tools



SOL/Workspace/Composer

PLAS/Workspace/Composer

(II) Animation of a working group for data description study

See the Michel Gangloff presentation on SPASE, then discuss

- (III) Scientific specification for the plasma node
(Use Case Analysis)
- (IV) Technical recommendations in coordination
with the top-node

- Step 1: plasmas-plasmas studies ⇒ toward elaborated specifications both scientific and technical
- Step 2: plasmas-others studies ⇒ use case with other nodes coordinated by the top node
- Step 2 //: top node driving the study for basic recommendations targeting communications between thematic nodes for what it is useful. **Necessity to be helped by experienced experts.**

Step 2 // is a key for fitting one of the main scientific objective for FP 7: study of planetary object as a whole.

Demonstrator #1

A norm (data model + dictionary): SPASE or SPASE extended

Some planetary plasma datasets reachable at different servers and described in respect to the norm

An XML based tool for building a registry

A search engine of the VSPO kind of this limited distributed database

Demonstration of the concept and its capacity for fitting the basic user requirements (access to targeted data).