SPASE

Centre de Données de la Physique des Plasmas
CNRS/CESR

What is SPASE ?

Space Physics Archive Search and Extract is

- An open international consortium formalized in 2003 with the goals of:
  - Facilitating data search and retrieval across the Space and Solar Physics data environment(Virtual Observatories and major data holdings)
  - Defining and maintaining a standard Data Model as a common language for Space and Solar Physics interoperability
  - Initially intend a level of description that allows to use the data retrieved
  - Add later a set of terms for specific access methods for direct retrieval
- U.S. participants funded by NASA since July 2005 until end of 2007. SPASE will receive "permanent support" from NSSDC after 2007.

SPASE Goals

- Conceptualize the domain of space physics data and resources to provide a model to be used for describing resources

To enable:

- Searching of data in multiple repositories
- Retrieving of data from multiple repositories
- Comparing physical quantities from different data centers with a common vocabulary

The Space Physics Data Environment

- Thousands of relatively small datasets as well as several large datasets (of time-series)
- Tens to hundreds of data centers or data providers (repositories), scattered worldwide
- Very diverse metadata terminology and data formats

SPASE Activities

- team of space physics scientists, information specialists to establish standards.
- Write a specification document for the Space Physics Data Model
- e-mail + bi-weekly teleconferences to update the model (minor changes).
- Face to face meetings (twice a year) to release stable versions of the data model. (next meeting at RAL,UK, July 9-11,2007)
- Test data model and its representation (XML) with descriptions of real world resources.
- Modify or extend the data model in response to community needs.
- Provide tools to facilitate usage of the model (e.g. Resource editor)

Who will use the Spase Model

Who will provide descriptions of their holdings compliant with SPASE:

- Virtual Observatories supported by NASA :
  - VHO (Heliospheric)
  - ViRBO (Radiation Belt)
  - VITMO (Ionosphere, Thermosphere and Mesosphere)
  - VMO/G (Magnetospheres)
  - VMO/U (Magnetospheres)
  - VSPO (Space Physics)
- ESA Cluster Data Archive
- Centre de Données de la Physique des Plasmas (CDPP)

Inside the SPASE Data Model

- Spase model = set of terms and their relationships that represent the essential concepts of solar & space physics

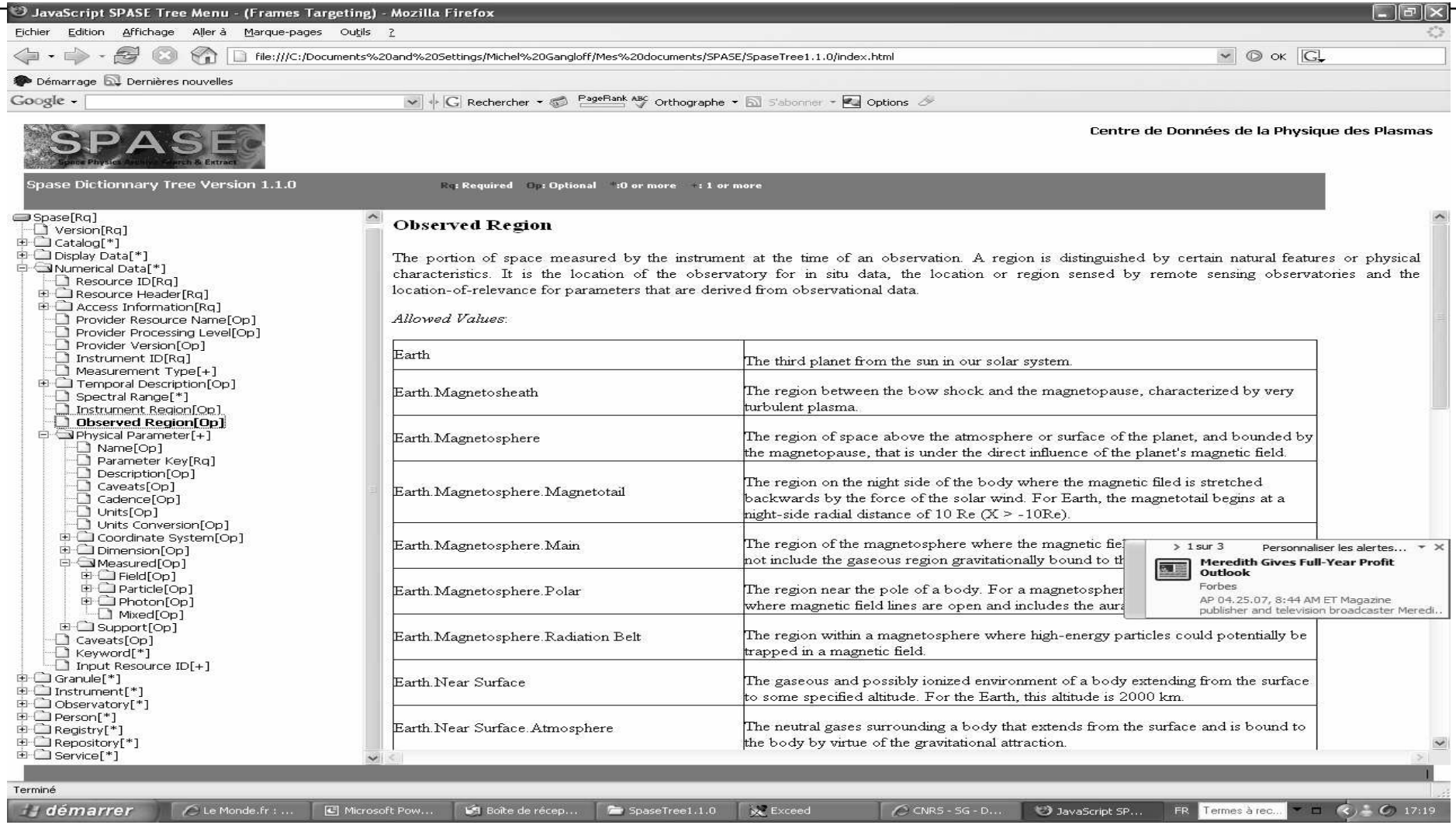
- Philosophy of the model : describe products using a classification of data sources and of physical world as represented in actual or potential datasets

- The SPASE Model Describes the scientific relevance of *products* resulting from observations [or modeling] in solar & space physics

- Types of *products* : numerical datasets containing physical quantities (e.g. magnetic field), plots, images, software, documentation, event lists

- Resource = spacecraft, instrument, repository, service, registry, people

SPASE Data Model Hierarchy



SPASE Dictionary : an example

Instrument Region	Enumeration

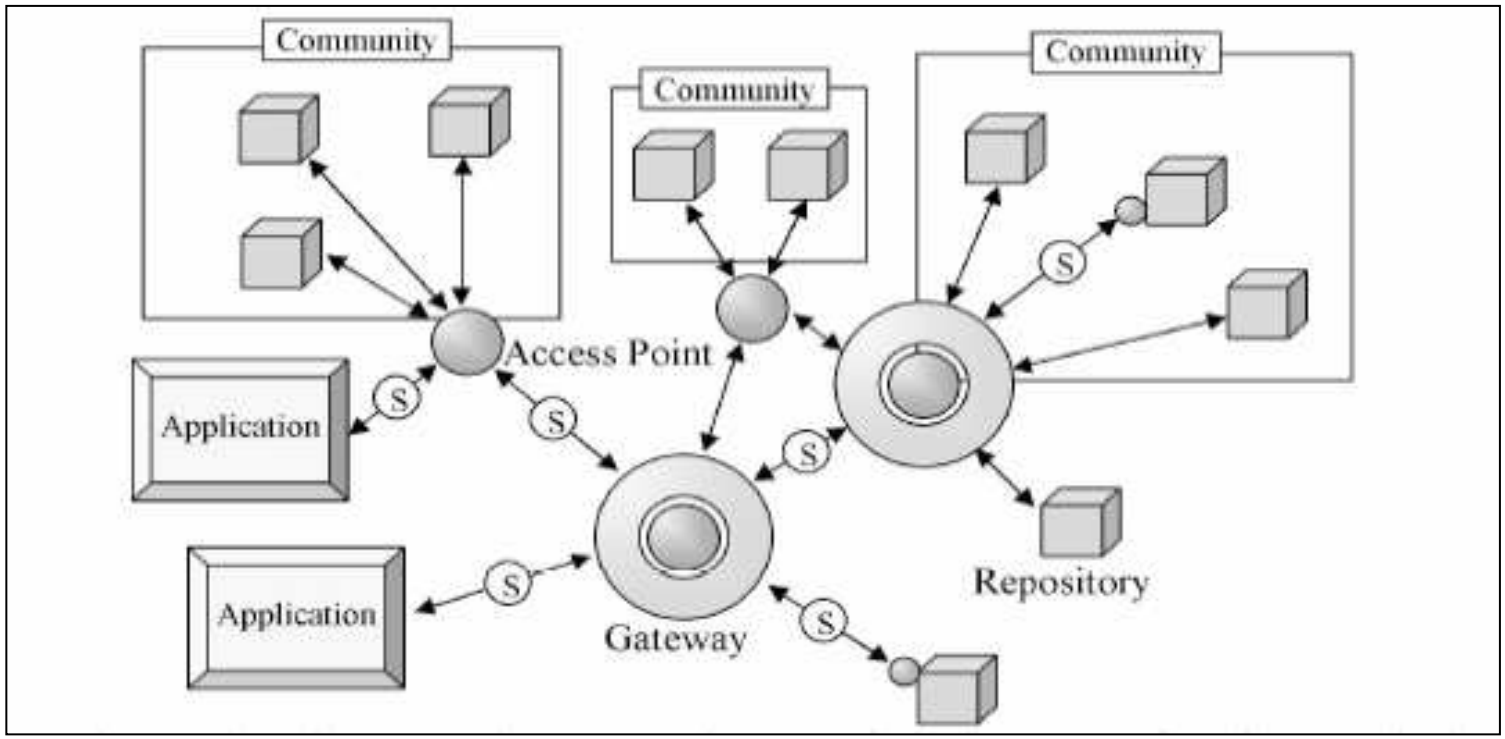
The portion of space occupied by the instrument at the time of an observation. A region is distinguished by certain natural features or physical characteristics.

Allowed Values:

- Asteroid
- Comet
- Earth
- Earth.Magnetosheath
- Earth.Magnetosphere
- Earth.Magnetosphere.Magnetotail
- Earth.Magnetosphere.Main
- Earth.Magnetosphere.Polar
- Earth.Magnetosphere.Radiation Belt
- Earth.Near Surface
- Earth.Near Surface.Atmosphere
- Earth.Near Surface.Auroral Region
- Earth.Near Surface.Ionosphere
- Earth.Surface
- Heliosphere
- Heliosphere.Inner
- Heliosphere.Near Earth
- Heliosphere.Outer
- Heliosphere.Remote 1AU
- Jupiter
- Mars
- Mercury
- Neptune
- Pluto
- Saturn
- Sun
- Sun.Chromosphere
- Sun.Corona
- Sun.Interior
- Sun.Photosphere
- Sun.Transition Region
- Uranus
- Venus

A possible implementation

- "S" indicates SPASE Data Model messages
- Access Point : Discipline specific VO Gateway : registry of large numbers of products w pointers to VxOs, repositories
- "Virtual Observatories" may be Gateways or Access Points.
- Information and Data flows from Applications to Repositories through Access Points and Gateways



Spase ToolKit

- Validator : determines compliance with spase data model
- Parser : library to parse SPASE XML (Java)
- Web-based or standalone Editors : to ease to process of creating a descriptor compliant with SPASE
- Harvester : extracts information from resource descriptions compliant with SPASE