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## LATEST VO DEVELOPMENTS AT PARIS VO DATA CENTER

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**Abstract.** Paris VO Data Center aims at providing VO access to its databases resources, at participating to international standards developments, at implementing VO compliant simulation codes and data visualisation and analysis softwares. We will present some of the latest VO developments involving resources from Paris VO Data Center, i.e, the first simple spectra access for data of the Nanay radiotelescope observatory, a validator for Simple Spectra Access protocols and its implementation tools, a Cone-search access to the exoplanet catalog, a pipeline for images processing to make them "science-ready" in vo-format, implementation of Simple Image Access using Geographic Information System in databases. Developments involving other resources may be found in their own contributions to this meeting.

### 1 Introduction

Paris VO Data Centre (<http://vo.obspm.fr/>) aims at providing VO access to its databases resources, at participating to international standards developments, at implementing VO compliant simulation codes and data visualisation and analysis softwares. The various activities are organised into portals whose functions are: 1) to provide visibility and information on the projects, 2) to encourage collaboration. Those portals are linked to thematic activities and resources. Paris VO Data Center offers a central support to the various projects through central storage, web servers and soon computing facilities. The central team will be reinforced with 2 new engineers in 2007. Paris VO Data Centre plays a role in training through tutorials and seminars.

### 2 Projects

**Simulations:** About 20 simulation codes are candidate for integration into the VO. These codes cover all fields of astrophysics from studies of the interstellar media to cosmology, treat simulations of media and interpretation of spectra. A code of simulation of the interstellar media (already public: <http://aristote.obspm.fr/MIS>), is currently adapted to be run via a classical web interface and should become part of an analysis chain for ALMA, using VO exchange protocols (Contact: F. Le Petit, LuTh, Paris Obs.).

**Integrating atomic and molecular data in the VO:** Basecol (<http://www.obspm.fr/basecol>) provides bibliographical and numerical data on excitation processes of molecules. Molat (<http://amrel.obspm.fr/molat/>) provides mostly spectroscopic data from measurements and calculations. The Basecol database is accessible both through a classical web interface and a webservice, its output format is html, text and VoTable. A collaborative

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group between Paris and ESAC is currently working on a Data Model for Atomic and Molecular Line Access within the VO (version 0.5 of the documents are available on the IVOA website: <http://www.ivoa.net>) (Contact: M.L. Dubernet, LERMA, Paris. Obs.)

**Solar System:** The IMCCE gives VO access to ephemerides, databases on astrometry and physical characteristics of solar system bodies, comets. A collaboration with the CDS allows to display the solar system objects in Aladin new version (Contact: W. Thuillot, IMCCE, Paris Obs.).

Databases for planetary atmospheres related to Mars-Express, to Cassini-Huygens, to later missions such as Venus-Express are developed (<http://cdap.ipsl.jussieu.fr>). They contain data coming from models and experimental data from in situ experiments (Contact: A. Sarkissian, IPSL).

A group (<http://portail.imcce.fr/fr/expert/ssvo/wgovp>) is involved on UCD definitions for planetology in the VO (Contact: P. Didelon, CEA, J. Berthier, IMCCE).

**Data Pipeline and Simulator:** TERAPIX astronomical data reduction center is dedicated to the processing of extremely large data flows from digital sky surveys (Contact: Y. Mellier, IAP).

The team in charge of the ALMA simulator develops the ALMA science Data Model (Contact: F. Viallefond, LERMA, Paris Obs.).

**Stars and Galaxies:** Access to some databases and analysis tools are already developed: Hyperleda from the Migale Project (<http://www.cai-mama.obspm.fr/migale/>) and Fuse are already available through SSA (Simple Spectra Access) protocol. Other resources will soon be available: the Giraffe Archive, Aspid. Some members are participating to the development of VO Standards for 3D spectroscopy. (Contact: J.-M. Désert, IAP for FUSE, P. Prugniel, GEPI, Paris Obs. for MIGALE)

A validator for the SSA protocol has been designed (Contact: P. Le Sidaner, I. Chilingarian, Paris Obs.)

**Sun:** BASS2000 propose daily observations of the sun taken from different places (Meudon, Tarbes, Nancy, le Pic du Midi) in various wavelengths. The data are available through EGSO (<http://www.egso.org/>) (European Grid of Solar Observations. A collaboration with SPASE has started in order to define standards for plasmas in the solar system. (Contact: J. Aboudarham, LESIA, Paris Obs.)

**Exoplanet:** The Exoplanet encyclopaedia is an online catalogue of exoplanets with physical and astronomical parameters which permits cross match and cross correlation on parameters for queries and visualisation, including a large bibliography. It is the first exoplanets catalog allowing a VO access via the cone search protocol (<http://vo.obspm.fr/exoplanetes/encyclo/>). The group participates to the Planet Finding Data Archiving Working Group for the definition of standards. (Contact: J. Schneider, LUTH, Paris Obs.).

**Celestial Reference System and Earth Orientation Parameters:** The SYRTE as co-responsible of the "International Celestial Reference System" gives information (collected from the VLBI) about reference systems (<http://hpiers.obspm.fr/icrs-pc>). It also provides Earth Orientation Parameters (<http://hpiers.obspm.fr/eop-pc>). A VO access to these databases will permit cross correlation with astronomical data reduction (Contact: A.M. Gontier, SYRTE, Paris Obs.).

**Legacy:** The following databases and survey will soon be available following VO protocols:

- Data from the Nanay Radio Astronomical Observatory: galactical databases HIG, Pulsar profile database (Contact: G. Theureau, NRT, GEPI, Paris Obs.).
- Digitalised survey SRCJ (B band) by the MAMA has a SIAP access (<http://voplus.obspm.fr/cgi-bin/sia.pl?>). Request can already been launched from Aladin (<http://voplus.obspm.fr/cgi-bin/sia.pl?POS=100.0,-79.0&SIZE=0.1,0.1>). (Contact: J. Guibert, CAI-GEPI, Paris Obs.).
- DENIS survey of the southern hemisphere in I,J,K band in his totality (including strip overlap) via SIAP (Contact: J. Borsenberger, GEPI, Paris Obs.).
- EROS project will give VO access to light curves (contact: E. Lesquoy, CEA).