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LATEST VO DEVELOPMENT AT VO-PARIS DATA CENTRE

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Abstract. VO-Paris Data Center aims at providing VO access to its databases resources, at participating to the development of interoperability standards, at implementing VO-compliant simulation codes and data visualization and analysis software. We will present some of the latest VO development involving resources from Paris VO Data Center, i.e, the first simple spectral access for data of the Nancay radio-telescope, a validator for Simple Spectra Access protocols and its implementation tools, a Cone-search access to the exo-planet catalog, a pipeline for image processing to make them "science-ready" and converting into 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

VO-Paris Data Centre (http://vo.obspm.fr/) aims at providing VO access to its databases resources, at participating to the development of interoperability standards, at implementing VO compliant simulation codes and data visualisation and analysis software. The various activities are organized into portals whose functions are:

1. To provide visibility and information on the projects;
2. To encourage collaborations.

Those portals are linked to thematic activities and resources. Paris VO Data Center offers a central support to the various projects through central storage facilities, web servers and computing facilities. 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 publically available: 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

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ALMA, using VO exchange protocols. The VO-compatible client has been developed to analyse the datasets coming from the PDR simulations. It will allow to integrate the code into the workflows. (Contact: F. Le Petit, LuTh, Paris Obs.).

We are working on the development and implementation of the Simple Numeric Access Protocol. The first implementation of the associated data model has been done for the Horizon GalMer database. (Contact: I. Chilingarian, LERMA, 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 web-service, with output formats as HTML, text and VOTable. A collaborative 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 web-site: http://www.ivoa.net) (Contact: M.L. Dubernet, LERMA, Paris. Obs.)

Solar System: The IMCCE provides VO access to ephemerides, databases on astrometry and physical characteristics of solar system bodies and comets. Thanks to a collaboration with the CDS, Skybot allows to display the solar system objects in Aladin (Contact: W. Thuillot, IMCCE, Paris Obs.). Databases for planetary atmospheres related to Mars-Express, to Cassini-Huygens, and 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 the following databases of spectra is provided through SSA (Simple Spectral Access) protocol: Hyperleda, FUSE, HIGi (HI data), Be-stars, Giraffe archive. We have developed the client to work with the data in the Euro3D format in a VO framework (VO-Paris Euro3D client). (Contact: J.-M. Désert, IAP for FUSE, I. Chilingarian & P. Prugniel, Paris Obs.). A validator for the SSA protocol has been designed (Contact: P. Le Sidaner, I. Chilingarian, Paris Obs.)

Sun: BASS2OOO proposes daily observations of the sun taken from different places (Meudon, Tarbes, Nancay, 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 plasma 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 visualization, including a large bibliography. It is the first explanets catalog allowing a VO access via the cone search protocol (http://vo.obspm.fr/exoplanetes/encyclo/). The group participates in 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" which provides information (collected from the VLBI) about reference systems (http://hpiers.obspm.fr/icrs-pc) as well as 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 surveys will soon be available through VO protocols:

- Data from the Nancay Radio Astronomical Observatory: galactic databases HIG, Pulsar profile database (Contact: G. Theureau, NRT, GEPI, Paris Obs.).

- Digitized surveys SRC-J (B band) and ESO-R by the MAMA now has an SIAP access: http://www.cai-mama.obspm.fr/mama/ (cf Fig. 1 and 2) (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).

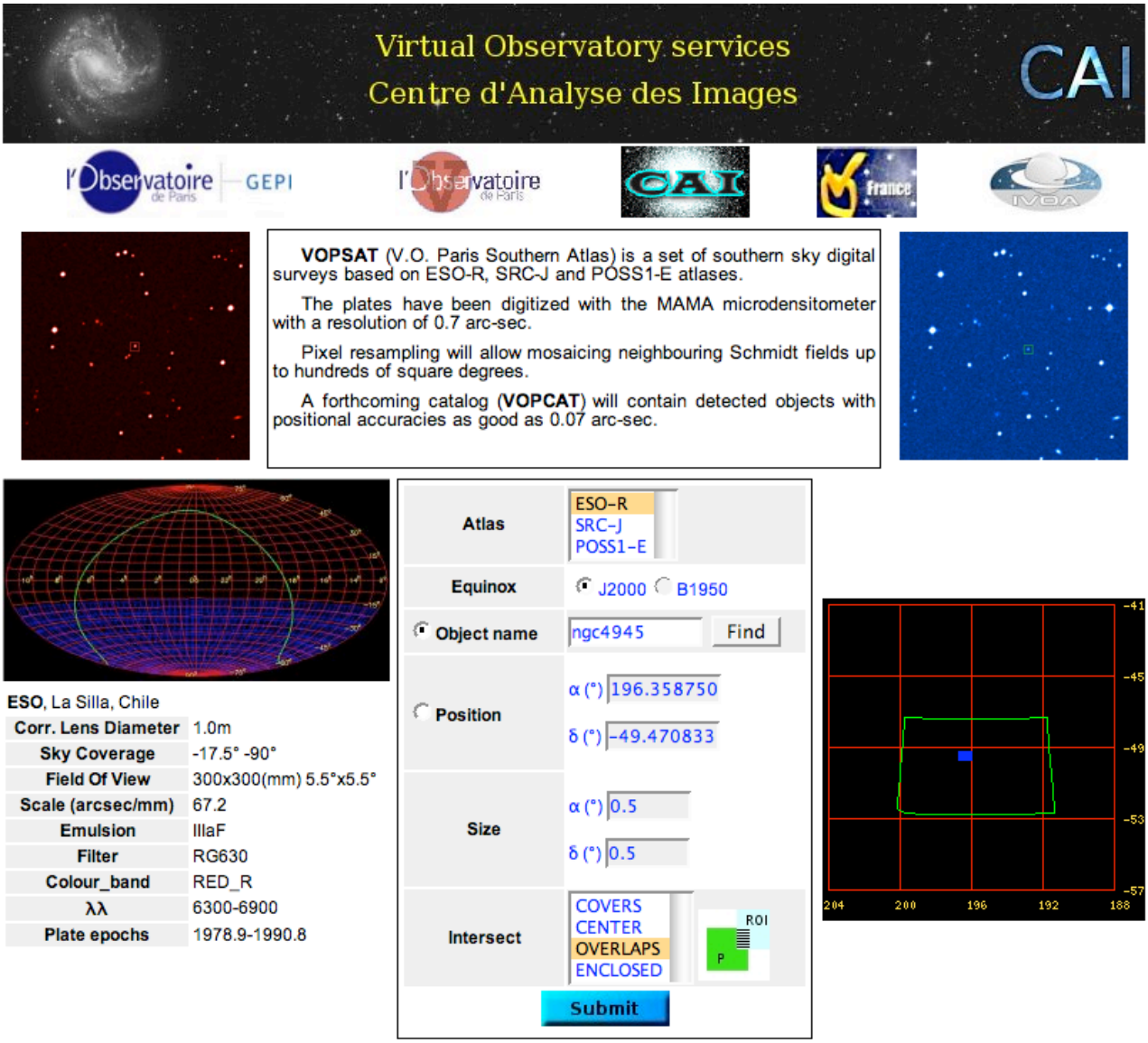
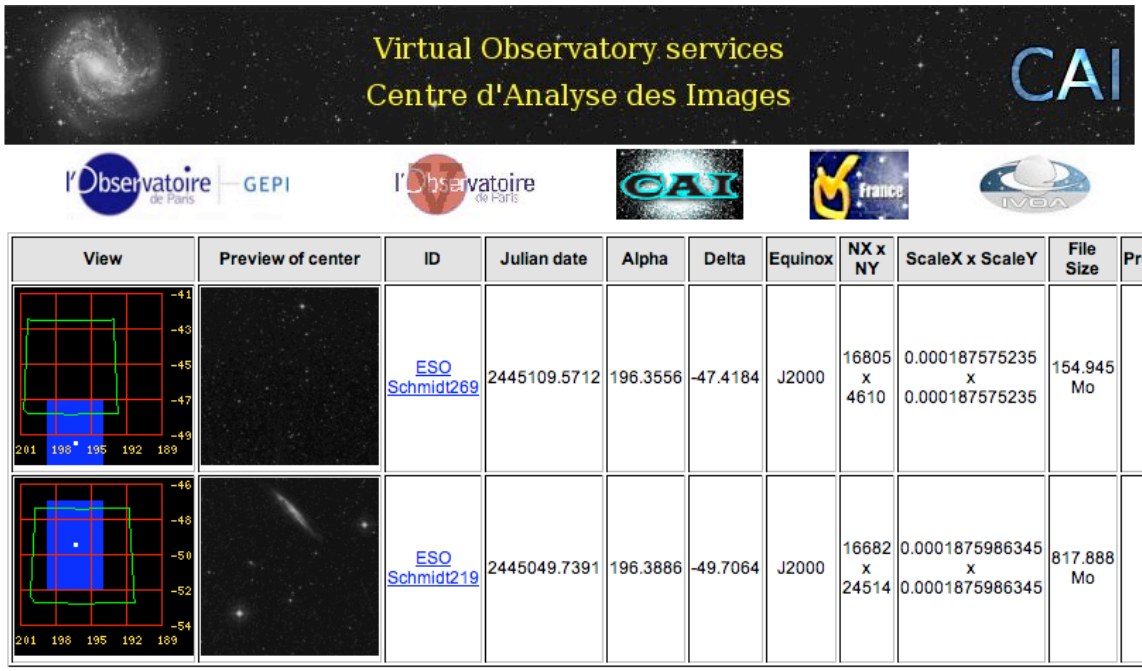


Fig. 1. Web access to the CAI surveys (1): The web application displays see the footprint of the survey and position of the Region Of Interest (ROI) on the plate



View	Preview of center	ID	Julian date	Alpha	Delta	Equinox	NX x NY	ScaleX x ScaleY	File Size	Projection	Tools
		ESO Schmidt269	2445109.5712	196.3556	-47.4184	J2000	16805 x 4610	0.000187575235 x 0.000187575235	154.945 Mo	TAN	Aladin
		ESO Schmidt219	2445049.7391	196.3886	-49.7064	J2000	16682 x 24514	0.0001875986345 x 0.0001875986345	817.888 Mo	TAN	Aladin

Fig. 2. Web access to the CAI surveys (2): An XSLT stylesheet provides a user-friendly display of the VOTable output of the SIA query. The result page contains the links to download the FITS image or display them in Aladin

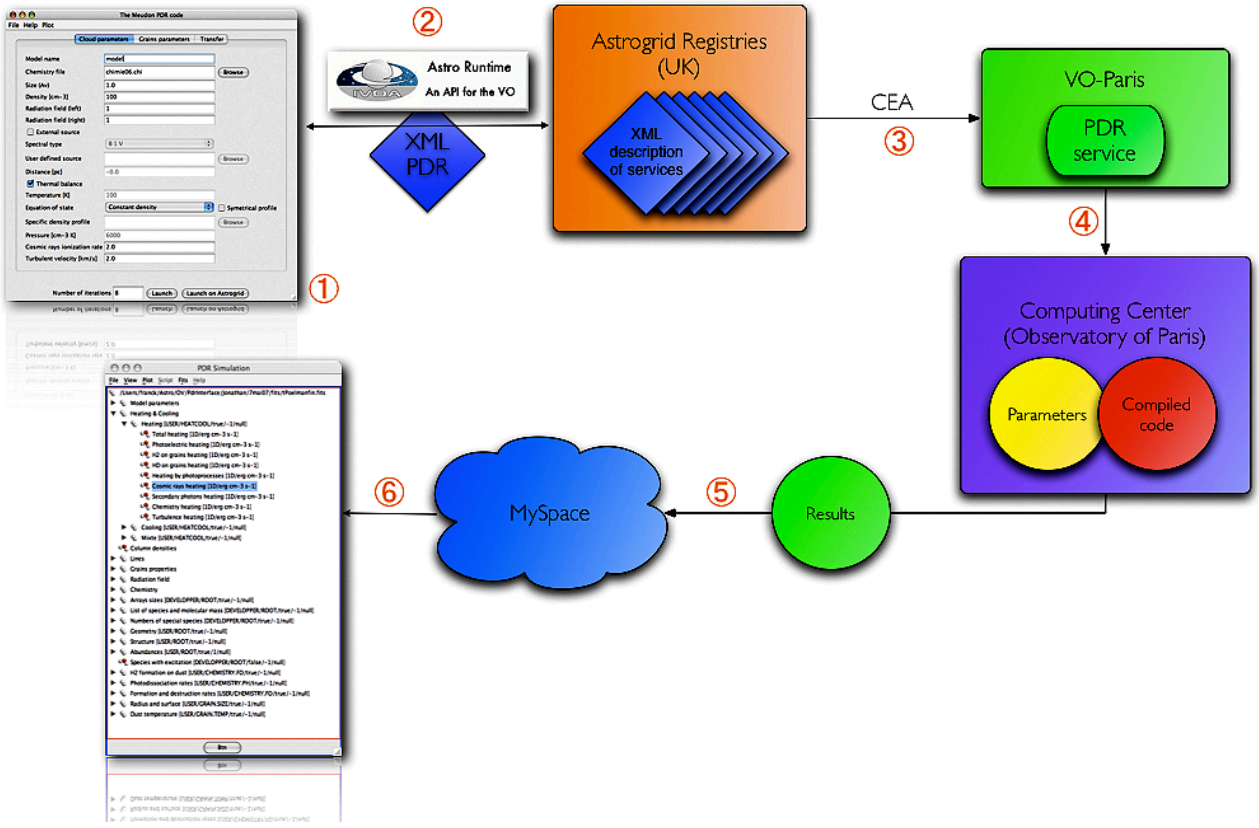


Fig. 3. Simulation: The workflow of the Meudon PDR code execution through Astrogrid