GGOS and Virtual Observatory

Geodetic Webservices thanks to VO-table format developed by astronomers

Keywords

Virtual Observatory, Metadata, Webservices, Space geodesy, Time series, Interoperability, Interface Astronomy-Geophysics.

Data and Webservices


Range bias per laser station found by OCA-GENIE, between station instrumental changes: http://maestro.obs-azur.fr/cgi-bin/query_mrb.pl


Flame bias per laser station found by OCA-GENIE, between station instrumental changes: http://maestro.obs-azur.fr/cgi-bin/query_mrb.pl


Links gathered on the ov-gaff web-page:

http://www.obs-azur.fr/heberges/ov-gaff

A new science *is* possible through VO-concept

We are convinced that the concept provided by International Virtual Observatory Alliance (http://www.ivoa.net/) could help our wide scientific community (fundamental astronomy, geophysics, geodynamics) to solve some problems which absolutely require contributions from each component of this community.

The scientific goals are, among others:

- developing webservice to directly interact within scientific analysis s/w,
- developing an efficient interface between different scientific communities linked to geodesy (fundamental astronomy and geophysics, in particular).

Abstract

One of the objectives of GGOS is to develop a web portal in order to promote very important and valuable products of the IAG services.

All the relevant data and products for Earth sciences and applications have to be made accessible through a GGOS portal. The development of such a tool will certainly require to work on the notions of interoperability, standardization, data access protocol, data model, web services.

The focus of this paper is to present the International Virtual Observatory Alliance (IVOA), which develops all these concepts in the field of astronomy since a few years. We also present the geodetic and fundamental astronomy component of the French part of IVOA, group called VO-GAFF. This group works on the definition of standards for the geodetic community (in terms of data model and Unified Content Data for example) and on the development of webservices.

We briefly discuss the advantages for GGOS to develop its portal in the context of virtual observatory, and in particular thanks to metadata described with a specific format, VO-table, developed by IVOA: the user is allowed to search for data wrt time or space, and heterogeneous data can be compared and transformed in an easy way.

Metadata and geodetic Webservices at Observatoire de la Côte d’Azur

Available data:
- Time series generated by OCA SLR analysis center (EOP + station coordinates)
- Time series provided by other groups
- Biases per SLR stations, adjusted between two technological events.

Work done:
- Definition of the database’s structure, for reference frame analysis purposes
- Automation of various steps of SLR data analyses (inside s/w GINS, DYNAMO, MATIO, CATREF).

Work in progress:
- Time series of station coordinates (SLR, LLR), following user’s requests to account (or not) for different models of variations (tides, loading, ...)
- Adding a VO-layer (VO-Table format) within the available data
- Requests for the database directly through the Web, and visualization of results through a dedicated graphic s/w.

Virtual forest and webservices

Use of data where they are stocked : VO-Table format (XML)
- To facilitate links between communities,
- Data need not to be duplicated
- Our database:
  - Contains solutions realized in an homogeneous reference frame over a given period of time (e.g. only one position and velocity per period for a given parameter)
  - Is a PostgreSQL DB which gives access to:
    - Time series per technic or analysis center
    - All solutions (per technic or analysis center) available for a given parameter

Webservices
- Compatibility between different s/w is ensured by VO-Table format
- Many existing tools using VO-Table format: visualization, transformation, extraction of data...
- Example: ASCii file:
  - Typical file of stations (same format for all stations)
  - VO-Table file:
    - Contains fields, as well as information describing the different fields

Astronomy sources, thanks to VO dedicated toolboxes.

- Taking benefit from the VO-table format to analyse dynamical and physical properties of radio sources
- Development of webservice to directly interact within scientific analysis s/w
- Developing an efficient interface between different scientific communities linked to geodesy (fundamental astronomy and geophysics, in particular).