GAVO-II AND THE RAVE SURVEY SPECTRAL DATABASE

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ABSTRACT

We present a short overview of GAVO-II, the German Virtual Obervatory, and ongoing and future VO-projects at the Astrophysical Institute Potsdam (AIP).

Key words: Virtual Observatory, GAVO-II, RAVE, AstroGrid-D.

1. INTRODUCTION

GAVO, the German Astrophysical Virtual Observatory (http://www.g-vo.org), is the central German platform for VO development. In fall of 2006 the second phase of the GAVO project started. It is sponsored by the German Ministry of Education and Research (BMBF) and is a collaborative effort of the following institutes: Zentrum für Astronomie der Universität Heidelberg (ZAH), Max-Planck-Institut für Extraterrestrische Physik (MPE), Technische Universität München, Universität Tübingen and the Astrophysikalisches Institut Potsdam (AIP).

2. GAVO-II PROJECTS

Several GAVO tasks aim to publish astronomical spectra:

- an IVOA compliant web-service for searching, downloading and creating simulated spectra of *planetary nebulae* (see paper by Thomas Rauch in this volume)
- a web-service publishing images with physical parameters and X-Ray spectra derived from *XMM observations* (`http://www.g-vo.org/XMM`)
- a simple-to-use, VO-compliant database for *solar spectra*
- a database related to the *Millennium web site* (`http://www.g-vo.org/Millennium`)

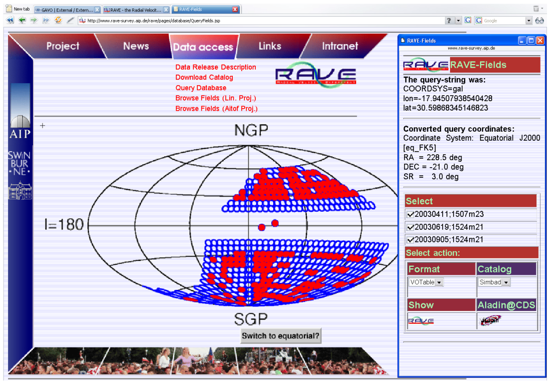

Figure 1. Data selection with the RAVE survey web-interface

GAVO will furthermore continue development of a tool for extracting metadata from FITS archives and mapping these to IVOA standards. Currently this tool exists for SIAP, in the near future SSAP will be supported.

3. THE RAVE SURVEY DATABASE

RAVE, the *RA*dial *V*elocity *E*xperiment, is a survey that will provide the radial velocity data of a million stars of the southern-hemisphere until 2010 (`http://www.rave-survey.aip.de`). It collects medium resolution spectra in the CA-triplet region (8410-8794 Å) for southern-hemisphere stars in the magnitude range 9-12.

The database currently returns the radial velocity and photometric measurements of 25,000 stars of first data release. It supports cone search and delivers VOTable output, either by a parameter search of a graphical data-selection interface, shown in Fig. 1. Apart from further improvements to the front end, a future update to the RAVE query interface will also allow to search and retrieve the observed spectra, using the IVOA spectral data model.

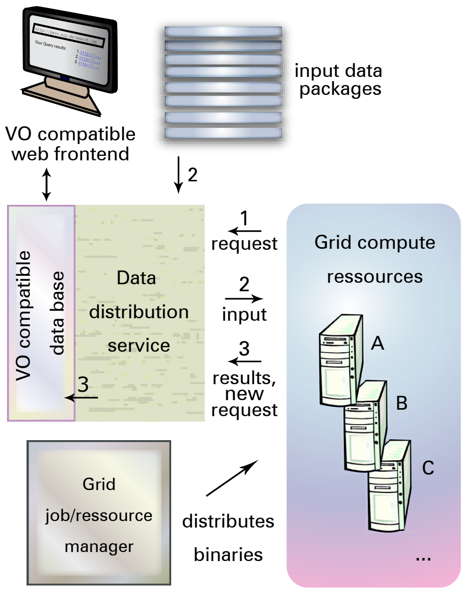

Figure 2. A "dealer type" data service to connect the Virtual Observatory and a computational grid

4. CONNECTING THE VIRTUAL OBSERVATORY WITH A COMPUTATIONAL GRID

One of the currently most promising tasks in E-Science is to form connections between the wealth of data offered by the Virtual Observatory and the computational power offered by computational grids. For GAVO-II we have developed a concept of a data distribution service that manages a workflow between a computational grid and a database with a Virtual Observatory frontend. We plan to further develop this concept to prototype stage for 2008 and to apply it to the German AstroGrid-D.

The simple design is mainly targeted on classical reduction of independend data or serial simulations without the need for interprocess communication. A possible application is the reduction of large quantities of spectral data. A key element is the inclusion if a VO-compatible database frontend that automatically publishes the results when they are returned from the grid.

The concept requires a code package that contains sources or binaries as well as the parameters necessary for the desired application. This package is first distributed on the grid using a grid resource/job manager. The data distribution service manages a stack of input data packages and, if necessary, also further, individual parameter files.

As can be seen in Fig. 2, the compute resources will then individually start the jobs received by requesting input data from the central distribution service (1). The service will then hand out the input data from its stack (2). Upon completion of the job the grid compute resources will then return the data results (or error messages) and request new input data. If no result is returned after a given time out period, the service will redistribute the unreturned package to a new resource. The results of the computation and the corresponding metadata is stored in a database using a pre-defined, VO-compatible mapping set. The database connects to a web frontend with VO compatible services to publish the results.

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