

Archiving Activities at the Astronomical Observatory of Asiago

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Abstract. Since July 1993 all observations collected by the 1.82m telescope at Cima Ekar (Asiago) are systematically archived on DAT cartridges and a listing of collected data, including all parameters of the observations, is maintained in a relational DBMS. In order to promote the scientific reuse of observations stored in this archive, we have developed a WWW interface based on the WDB software, that enable users to perform complex searches in the observation log. In this paper we give an overview of the archive, briefly describe the WWW-based search interface as well as planned future enhancements to the archiving system.

1. Introduction

In the past few years astronomers which observed with the Copernico 1.82m telescope have asked for an archiving facility that could serve as a repository of all observational data and provide astronomers with a backup copy of their observations in case of data loss.

Following this request, since July 1993 an archiving facility has been set up at the Astronomical Observatory of Asiago (Mt. Ekar) where all observations are routinely stored on DAT cartridges and catalogued using a relational DBMS. In a first phase, the archive facility did not foresee network access: archive searches could be performed only at the Mt. Ekar Observatory archive system, or at a twin system located at the Astronomical Observatory of Padova.

In order to give access to the Copernico Archive to the widest possible community of users, a WWW-based search facility was developed and installed at the Astronomical Observatory of Padova, which is better connected to the Internet.

In this report we give an overview of the archiving system and describe the main features of the WWW-based search interface.

2. The Archiving System

The Copernico Telescope Archiving System is made up of a *master archive*, where the observation list is generated and maintained, and a *public archive*, where a copy of the observation list is accessible through a WWW-based interface.

The *master* archive software consists of a collection of programs that run in the Windows environment and that use the FoxPro relational database management system (RDBMS) for data handling. It allows for:

- daily ingestion of the list of new observations;
- correction/insertion of incorrect/missing data;
- local archive searching.

The observation list maintained in the *master* archive is named the *master catalogue*: corrections and updates are made to this list only, they eventually propagate to the *public* archive during the periodic transfer of data from the *master* to the *public* archive.

The *public* archive software consists of a collection of programs that run on a Linux system and that use the MiniSQL RDBMS (Hughes Technologies 1997). It is responsible for:

- periodic synchronization of the *public* archive's content with the *master* archive;
- handling of queries from archive users.

3. Overview of the Archiving Process

During the observations all images and spectra taken by the astronomer are stored on disk in FITS files by the data acquisition system (Baruffolo & D'Alessandro 1993). At the end of each observing night these files are transferred on DAT cartridges: during this step a listing of observations is generated and this list is *ingested* into the archive. For each data file parameters that characterize the observation are extracted or derived from the FITS header and the data are displayed and checked for consistency; three other parameters which give the location of the data on the archive medium are then added to those describing the observation.

Periodically the most recent part of the observation catalogue is dumped to ASCII files and transferred to the *public* archive. In the public archive machine a procedure automatically starts at fixed intervals, checks for new data coming from the master archive and loads them into a miniSQL database. During this pass some additional checks are performed on the data and a report is generated signaling errors and/or missing data so that the *master* catalogue can be corrected further.

4. Archive Content

At the time of writing, the Asiago archive contains more than 16000 frames. This figure includes all science exposures (images and spectra) and all calibration data (bias, dark, flat field and comparison spectra). Table 1 gives a summary of all archived data by image type and by instrument.

Table 1. Summary of the archive content by image type and by instrument

Image type	Nr. of Frames	Instrument	Nr. Of Frames
tvcamera	11	Boller & Chivens	7105
test	143	Echelle	5498
bias	1069	Imaging camera	3425
calib	3339		
dark	153		
flat	2248		
focus	244		
object	8821		

5. WWW Access to the Archive

WWW access to the archive is available from the Asiago Observatory Home page¹ and is realized using the WDB software version 1.3a (Rasmussen 1995), modified to work with miniSQL and to allow ordering of results on a user-selected field. When the user accesses the archive by opening its URL in a Web browser, a query form is generated on-the-fly by WDB on the basis of a form definition file (FDF). Searches can be constrained by filling in the form and then clicking on the **search** button; archive last modification time can be retrieved by following an *hyperlink* located towards the top of the query form.

The query form consists of *action buttons*, which initiate an action when clicked, *query fields*, which are used to constrain searches, *additional parameters*, which can be added to the query output, and *output controls*, which control how query output is formatted and how many data rows are retrieved by a query. These items have been discussed in detail in another paper (Baruffolo, Falomo, & Contri 1997).

6. Requesting Archived Data

At present there is no facility for automatically requesting data that have been selected using the archive query form. A user willing to retrieve data from the archive must send the list of requested observations (that must include the keyword “CODICE”) to the archive maintainer who will forward it to the technical staff at the Asiago Observatory. Observations will then be retrieved from the archive media and delivered to the requester on DAT cartridges or stored on disk for ftp transfer. Further information on how to request archived data and contact points for the archive maintainer can be found on the archive WWW page.

The actual policy of the Observatory on data distribution is that the observations become public domain two years after the observation date.

¹<http://www.pd.astro.it/asiago/asiago.html>

7. Conclusions and Future Work

In 1993 we started to systematically store all observations collected at the 182 cm. telescope in FITS format and to produce listings containing the parameters that characterize them. At that time the development of the Web was still in its infancy and network access to the archive was not foreseen, since this would have implied the development of a custom client/server user interface. However, having maintained the observation list in a relational DBMS has allowed us to upgrade the archive system with Web access with relatively little effort.

The WWW interface to the archive has been available for more than one year now, no major problems were reported during this initial operational period.

Future work on the public archive is planned to provide preview images, storage of data on optical disks (recordable CD-ROMs) and to automate archive data requests.

Finally, it is to be noted that provision has been made in the public archive software for inclusion of observations coming from the other two telescopes working at the Asiago sites: the 67/92 cm. Schmidt and the 122 cm. telescope. For the first of these, which still operates using photographic plates, a preliminary database (only working on a PC) is available, it contains data collected since 1965. The 122 cm. telescope has been recently equipped with a CCD detector and it is planned to only archive these recent data.

References

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