

ASTRONOMICAL DATA ANALYSIS CENTER (ADAC) OF THE NATIONAL ASTRONOMICAL OBSERVATORY OF JAPAN

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Abstract. The astronomical database service in Japan is now provided by the Astronomical Data Analysis Center (ADAC) of the National Astronomical Observatory (NAO) of Japan. We explain the role of ADAC in NAO, the database services provided by ADAC and its present and future activities.

Key words: databases – catalogs – data archives

1. INTRODUCTION

Astronomical databases have been rapidly gaining importance in Japan in the last few years due both to the big bang of international computer network communications and to the evolution of modern astronomical observations such as based on space techniques and big telescopes. We need a well organized database service on our own computer network, or we must provide a well systematized data archive service for astronomical observations in Japan.

The National Astronomical Observatory (NAO) of Japan was established in 1988 with the aim of becoming the national center of Japanese astronomy. The Astronomical Data Analysis Center (ADAC), which is one of the divisions of NAO, is designed to become a central part of astronomical database work in Japan.

However, ADAC has more roles in NAO. Among them is the management of computer facilities within NAO. Because of its limited manpower, ADAC needs many outside collaborators for these services. The Japanese Institute of Space and Astronautical Science

(ISAS) has developed elaborate data archiving systems for space observations. In the near future there will be an urgent need for the development of a data archive system for the big Japanese telescope "Subaru". We show the present situation of ADAC in this context.

2. ADAC's ROLE IN NAO

ADAC is one of the divisions of NAO. Its primary function is the management of computer facilities in NAO which includes:

- Supercomputers for astronomical simulation;
- Many workstations for astronomical data analysis;
- Mass storage system for astronomical database service;
- Peripherals, e.g. scanners or color printers;
- Local area network systems connecting these devices;
- Application software on these computers.

In addition to the management, ADAC is expected to perform the following functions:

- Development of simulation systems on the supercomputer;
- Development of software for astronomical data analysis;
- Various astronomical database services and their development.

As described in the previous section, most of the projects under development are carried out in cooperation with external collaborators because of the lack of manpower in ADAC. For example, the MOKA archiving and servicing system for observational data has been developed by such a group. A description of MOKA can be found in another report in this volume (Takata 1997).

I am engaged in the work on database services which will be described in the next section.

3. DATABASE SERVICES IN ADAC

The hardware system of the ADAC database service consists of:

- Sun workstation (S-4/5 M70) named `adac.mtk.nao.ac.jp`;
- 20 GB hard disk and a CD-ROM juke-box for 500 disks;
- 30 GB array disk and 2.4 TB VHS mass storage system;
- 1.5 Mbps connection to the Japanese Internet system SINET.

Based on this system, we have developed the services for the following databases:

- Astronomical catalog data;
- MOKA ground-based observational data archive;
- Digitized sky survey CD-ROM data, etc.

Since its foundation in 1988 ADAC has been one of the catalog data centers working in cooperation with CDS, NASA/ADC, etc. Following the recent worldwide expansion of the Internet, we began developing a new catalog service, which became operational in the spring of 1995.

The new service consists of a mirroring system which mirrors the CDS catalog service, FTP and WWW distribution systems for these catalogs as well as for our own original catalogs, and a system for collecting astronomical data published in Japan. NASA ADC's catalogs are imported semi-automatically. Details are reported by Takata et al. (1997) in this volume.

The only observatory in Japan that has made a serious effort in archiving observational data is ISAS (Institute of Space and Astronautical Science) with its data archive system for space observations. However, in view of the obvious and urgent need for such a system, ADAC has recently begun to develop its own service within the framework of a project named MOKA.

MOKA is, as described in another report in this volume (Takata 1997), an observational data archive system for some ground-based observations made in Japanese observatories. It is a client-server system, and the server, which is located at ADAC, provides an archived database and its retrieval system. Quick look viewing tools allow the observed images and spectra to be displayed on a user's client system. It has been developed in anticipation of a future archive system which will be used in the large Japanese telescope "Subaru".

The observational data archive service includes a cooperative database service already provided by some archival centers, such as HST data archived by STScI. This kind of service will be our next target for the nearest future.

4. STAFF AND COOPERATORS IN AND AROUND ADAC

Under the Director Dr. Y. Chikada, seven staff astronomers and technicians are now engaged in the work described above, i.e. the management of the vast computer and network system in NAO, maintaining various services and developing new services. Two other

NAO staff members are specially engaged in the management of the supercomputer system.

However, more collaborators are needed from outside ADAC, especially for the development of new services. The Internet catalog service system was developed by a team of seven members, four of whom were contributors from outside. MOKA was developed by eight members, of whom five were from outside.

In conclusion, ADAC now can provide facilities for computational work. It is necessary for ADAC to find persons who are interested in, or need to use, the astronomical database in order to develop the service system.

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