

ON-LINE SERVICES AT CDS FOR DISTRIBUTION OF HIPPARCOS DATA

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ABSTRACT

CDS has been implementing the following functionalities for a timely distribution of Hipparcos and Tycho products, when they are released, in June 1997:

1. Access will be given to the Hipparcos catalogues (ESA 1997) through the VizieR catalogue browser, allowing queries by any of the catalogue fields. A frequent use of the system will be the extraction of Hipparcos or Tycho records related to a given area of the sky, defined by its coordinates or by the name of a central object (this last functionality making use of the SIMBAD name resolver).
2. Access will be given to Hipparcos result catalogues through the 'Astronomer's Bazaar' (ftp access to the complete files). The system supports the transfer of compressed files in order to optimize use of network bandwidth.
3. The Hipparcos and Tycho Catalogues will be included within SIMBAD as soon as possible after the June 1997 release date. The work has already been prepared with the Input Catalogues; nevertheless, it will take some time before a number of inconsistencies are investigated and solved.
4. The Aladin interactive sky atlas, in its final development phase, will also support access to the Hipparcos and Tycho data for photometric and astrometric calibration and for overlays on digitized sky images.

In the future, as CDS services continue to evolve, more links will be added between these services and the associated bibliographic services, allowing yet more powerful support for the usage of Hipparcos or Tycho data products.

Key words: Catalogues; CDS.

1. INTRODUCTION

The objective of the Strasbourg astronomical Data Centre (CDS) is to provide on-line data and information for the world-wide astronomical community.

This is done through the development of a set of complementary information services (see e.g. Egret et al. 1995, Genova et al. 1996).

The common gateway to all these services is the CDS home page on the World-Wide Web at <http://cdsweb.u-strasbg.fr/>

We describe here how these services can be used for gaining access to Hipparcos and Tycho data and catalogues.

2. ACCESS TO INDIVIDUAL RECORDS THROUGH RELATIONAL QUERIES

Access to Hipparcos and Tycho data will first be provided through the new 'VizieR' catalogue service which allows the retrieval of individual data records from selections on table columns, or from position or object name.

VizieR (Ochsenbein 1997), the CDS service for astronomical catalogues, is the result of a joint effort between the Strasbourg astronomical Data Centre and the Information Systems Division of the European Space Agency (ESA-ESRIN) in order to provide the astronomical community with a dedicated tool for retrieving astronomical data listed in published catalogues and tables.

Access to Hipparcos and Tycho result catalogues through VizieR will start with Hipparcos and Tycho main catalogues, as soon as they are released, and will also include Annex files for Double and Variable stars and Solar system Annexes. Functionalities include selection of individual records, for a given area of the sky, or by parameter ranges (on any field). Full documentation of the catalogues will be available on-line.

Example: Extraction of Hipparcos or Tycho records for stars brighter than 9.0, having good astrometric quality, in a given area of the sky, defined by coordinates or name of a central object (this last functionality making use of the SIMBAD name resolver).

The interface is based on the use of World-Wide Web forms. The reference number for the Hipparcos and Tycho Catalogues (ESA 1997) in the CDS system is I/239.

The release date for this service is Tuesday 17 June 1997, at the following address:
<http://vizier.u-strasbg.fr/>

3. ACCESS TO THE COMPLETE FILES FOR FTP TRANSFER

Access to all Hipparcos and Tycho result catalogues distributed by ESA on CD-ROMs (except Epoch Photometry) will be provided through the 'Astronomer's Bazaar'.

The Astronomer's Bazaar (Egret & Ochsenbein 1994) is a World-Wide Web service allowing:

- to query the full list of available catalogues and tables, by keyword, or in browse mode, in order to select the relevant files,
- to display the corresponding documentation,
- and to retrieve the complete electronic files (eventually compressed), in ASCII or FITS format, from the anonymous ftp space of the CDS server.

More than 2000 catalogues and tables, for a total of several Gigabytes of data are currently available through this interface.

Functionalities include the transfer of complete ASCII files using the popular File Transfer Protocol (ftp). The system supports the transfer of compressed files in order to optimize use of network bandwidth. Flexible Image Transport System (FITS) format may be generated on the fly.

Warning: some of the files are very large! When possible, CD-ROMs of the Hipparcos mission, distributed by ESA, should be preferred, as more appropriate transfer media, for the large files of the Hipparcos and Tycho Catalogues.

The reference number for the Hipparcos and Tycho Catalogues (ESA 1997) in the CDS system is I/239.

The release date for this service is Tuesday 24 June 1997, at the following address:
<http://cdsweb.u-strasbg.fr/Cats.html>

Mirror copies are also available at the NASA Astronomical Data Center: <http://adc.gsfc.nasa.gov>, and at the National Astronomical Observatory in Tokyo: <http://adac.mtk.nao.ac.jp>

4. ACCESS TO COMPLEMENTARY INFORMATION FOR THE OBJECTS

The SIMBAD data base is a powerful tool for providing complementary information, when available in the published literature, for astronomical objects observed by the Hipparcos space astrometry mission.

The specificity of the SIMBAD data base (see e.g. Egret et al. 1991) is to organize the information per

astronomical object, thus offering a unique perspective on astronomical data. This is done through a careful cross-identification of objects from catalogues, lists, and journal articles. The ability to gather together any sort of published observational data related to stars or galaxies has made SIMBAD a key tool used worldwide for all kinds of astronomical studies. SIMBAD includes bibliographic references to papers citing the objects, thanks to a bibliographic survey covering the astronomical literature since 1950 for stars, and since 1983 for extragalactic objects. The data base is kept up-to-date on a daily basis, as the result of the collaboration of CDS with bibliographers in the Institut d'Astrophysique de Paris and the Paris and Bordeaux observatories (Laloë 1995).

In preparation for the release of Hipparcos data, a specific effort has been undertaken at CDS in recent years to fold into the data base large astronomical stellar catalogues, together with their specific identifiers and measurements, such as the PPM catalogue (Röser & Bastian 1991).

Functionalities include access to cross-identification, measurements and complete bibliography for individual objects, called by name, or for lists of objects selected by criteria.

Examples:

- Selection of all A-type stars observed with the International Ultraviolet Explorer (IUE) and measured by Hipparcos.
- Search for recent bibliography of all RR Lyrae stars observed by Hipparcos.

Several interfaces are available: World-Wide Web forms, X-Window client, line-by-line command interface.

Hipparcos stars can be found under their HIC or HIP numbers, Tycho stars under their TYC numbers.

Release dates: HIC numbers are already included in SIMBAD, and consequently integration of HIP stars is approximately 99 per cent complete. Gradual inclusion of Tycho entries will start in June 1997. The work has already been prepared with the Tycho Input Catalogue, and with the cross-identification of the Tycho Catalogue with several major catalogues (see Egret & Fabricius 1997); nevertheless, it will take some time before a number of inconsistencies are investigated and solved.

SIMBAD is available at the following address:
<http://simbad.u-strasbg.fr/>

5. ACCESS TO RELATED IMAGES OF THE DIGITIZED SKY

The 'Aladin' interactive sky atlas, now in its final development phase (see e.g. Bonnarel et al. 1997), will include links to the Hipparcos and Tycho Catalogues.

Aladin is a new project nearing completion which allows the user to visualize on his/her own workstation

digitized images of any part of the sky, to overlay entries from astronomical catalogues or user data files, and to interactively access the related data and information from the SIMBAD data base for all known objects in the field.

The data base currently includes the first Digitized Sky Survey (DSS-I) produced by the Space Telescope Science Institute, covering the complete sky, as a set of slightly compressed images. Images of the second epoch survey (DSS-II; Lasker et al. 1996) are gradually being included. In addition, high resolution images of crowded regions of the sky (e.g. Galactic Plane and Magellanic Clouds) have been provided by the MAMA (Machine à Mesurer pour l'Astronomie) facility at Observatoire de Paris, and by SuperCosmos of the Royal Observatory in Edinburgh.

The interface is based on a specific X-Window client program, to be installed on the user's site.

Currently (May 1997), Aladin is only available from a limited number of sites; it will eventually become a public interactive tool, available through the data networks. CDS should be contacted for further details.

The Hipparcos and Tycho Catalogues will be available for overlays on digitized images of the sky.

An example of a use of the Aladin service is the multi-wavelength cross-identification of sources detected in the X-ray domain, with Tycho stars. Users will also be able to call the Tycho catalogue for a new photometric and astrometric calibration of a given area in order to extract the full information from the digitized plates.

6. FUTURE PERSPECTIVES

In the future, as CDS services continue to evolve, more links will be added between these services, and the associated bibliographic information systems, as well as other distributed archives, allowing yet more powerful support for the usage of Hipparcos or Tycho data products.

In the shorter term, additional tools for direct and optimal access to specific subsets of Hipparcos/Tycho data are being considered: they will be found under the CDS Web pages.

ACKNOWLEDGMENTS

The Strasbourg astronomical Data Centre (CDS), is hosted by the Strasbourg astronomical Observatory, and funded by the French Institut National des Sciences de l'Univers (INSU, CNRS). VizieR has been developed with the support of the European Space Agency. Aladin is being developed with the support of the Centre National d'Etudes Spatiales (CNES) and INSU.

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