

The COROT Archive at LAEFF

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Abstract We describe here the main capabilities of the COROT Archive. The archive¹, managed at LAEFF in the framework of the Spanish Virtual Observatory², has been developed following the standards and requirements defined by IVOA³. The COROT archive at LAEFF will be publicly available by the end of 2008.

1 Introduction

COROT(‘**C**Onveccion, **R**Otation and **T**ransits’) is a mission with a twofold objective: the study of the stellar interiors using asteroseismology techniques and the discovery of extrasolar planets using the method of transits. By its high photometric performances and its observing runs covering five months without interruption, COROT is a pioneering project in the discovery of telluric extrasolar planets, bodies with properties comparable to those of the rocky planets of the solar system, and in the study of the internal structure of stellar objects with a precision never achieved before. Successfully launched in December 2006, COROT is performing nominally.

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¹ <http://sdc.laeff.inta.es/corotfa/jsp/searchform.jsp>

² <http://svo.laeff.inta.es>

³ <http://www.ivoa.net>

Data delivered to the Principal Investigators and Co-Investigators of the project are already producing important results like the discovery of several Jupiter-sized extrasolar planets or the detection of oscillations and granulations in solar-like stars.

In March 2003 LAEFF was selected as responsible for the development and maintenance of the VO-compliant COROT Archive. The system design was driven by the concept of delivering science-ready data in a simple and efficient way. An overall description of the system capabilities is given in the next section.

2 Functionalities

2.1 *Archive Search*

The query to the archive is made by means of an HTML fill-in form which permits queries driven by observing run, observational programme (asteroseismology or exoplanets), type of data (light curves or imagerettes), object name, COROT identification and coordinates and radius. Searches can be filtered by different criteria like observing date, V magnitude, (B-V) color, effective temperature, spectral type, luminosity class or variability type. Searches are case-independent, and wildcards are permitted. The system also incorporates a built-in name resolver, allowing queries by any of the names provided by the SIMBAD database. The output fields may be ordered by coordinates or COROT identifier and the output format can be retrieved in HTML with a pre-defined number of results shown per page. (Fig. 1).

2.2 *Results from Search*

An example of the result of a query is given in Fig. 2. Data of interest can be retrieved as FITS, VOTable or ASCII files. In addition to this, the following functionalities are provided:

- **Link to SIMBAD:** By clicking the object name, a list of alternative names as provided by SIMBAD is displayed.
- **Multidownload:** Data in FITS format can be retrieved in groups. For multiple retrieval it is possible to include or exclude individual datasets. Multiple download generates a file in zip format.
- **FITS Header/Data preview:** A browse plot of the light curve as well as a visualization of the associated FITS header is generated by clicking on the corresponding link. The user can select the columns to be plotted. Zoom views can be generated by dragging the mouse on the light curve and click on the *Zoom* button. (Fig. 3).

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Run:

Data Type

☒ Asteroseismology
☐ Light curves
☐ Images
☐ Wavelengths

☒ Exoplanet
☐ Monochromatic Light Curves
☐ Chromatic Light Curves
☐ Images
☐ Wavelengths

☐ Context

Search

Corot ID:
 Object ID:
 Coordinates List:
 Radius: deg
* Coordinates Format: deg deg or hh:mm:ss dd:mm:ss

Light Curve Filter Criteria

Obs Date: From: - To: -
 Vmag: - B-V: - Teff: -

Spectype: Lumclass: Stellar Variability:

Select Output:
 Format: Order By: Show: Page to show:

HOME | COROTSKY | COROT | LAEFF
Version 0.8 - February 2008

Fig. 1 Search Form

- VO Discovery tool: a discovery tool developed by the Spanish Virtual Observatory provides information on the catalogues, images and spectra available from VO services containing information of the object (Fig. 4).
- Supervised classification: At the end of the mission COROT will produce light curves for up to 60000 stars with a sampling rate better than 10 minutes during 5 months. Among this large sample, many new variable stars of known and unknown type will be present. Fast classification is an important step for the further analysis of the objects of interest. The Spanish VO together with the Leuven University is developing a supervised classifier to be used with COROT data ([1] [2]). Information on classification can be accessed from the COROT archive (Fig. 2).

References

1. Debosscher, J., Sarro, L.M., Aerts, C. Automated supervised classification of variable stars I. Methodology, 2007, A&A
2. Sarro, L.M., Debosscher, J., López, M., Aerts, C., Automated supervised classification methods of variable stars II. Application to the OGLE database, 2008, A&A

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Retrieve Marked Data

Mark: ☐ Retrieval Format: ☐

ASTEROSEISMOLOGY

RUN	COROT ID	OBJECT ID	RA(J2000)	DEC(J2000)	START DATE	END DATE	Sptype	LUM	VMAG	S-V	TEFF	BROWSE	FETCHMARK	FETCHMARK	FETCHMARK	VO
Ru#1	20	HD49312	102.718	-0.54089	2007-01-01	2007-04-02	F2	V	9.77	0.39	6467.0	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable
Ru#1	223	HD50170	102.956	-2.17004	2007-01-01	2007-04-02	F2	V	8.81	0.46	6360.0	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable
Ru#1	187	HD50405	103.262	-1.86383	2007-02-06	2007-04-02	A0	V	9.32	-0.01	10290.0	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable
Ru#1	116	HD50742	103.602	-1.12888	2007-01-01	2007-04-02	A4	N	5.40	0.18	7780.0	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable
Ru#1	83	HD50773	103.634	-0.63264	2007-02-03	2007-04-02	A2	V	9.38	0.14	9401.0	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable
Ru#1	203	HD50790	103.686	-2.12311	2007-02-06	2007-04-02	F8	V	8.48	0.43	5477.0	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable

EXOPLANET

RUN	COROT ID	TYPE	RA(J2000)	DEC(J2000)	START DATE	END DATE	Sptype	LUM	VMAG	S-V	BROWSE	FETCHMARK	FETCHMARK	FETCHMARK	VO	CLASS PRIO	CLASS PRIO	CLASS PRIO	CLASS PRIO	CLASS PRIO		
Ru#1	103060006	nonchronic	100.88	-0.07338	2007-02-03	2007-04-02	G4	V	16.088	0.00	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	ROAD	0.07086	PVSG	0.24669	BE	0.06602
Ru#1	103060403	nonchronic	100.888	-0.73267	2007-02-03	2007-04-02	F7	V	14.789	0.038	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	ROAD	0.06763	LEV	0.137766	HABBE	0.134075
Ru#1	103060412	chronic	100.888	-0.68916	2007-02-03	2007-04-02	A8	V	13.966	0.277	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	LACEP	0.331738	BE	0.109051	FUORI	0.114008
Ru#1	103060618	nonchronic	100.892	-0.71633	2007-02-03	2007-04-02	G3	V	14.729	0.086	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	ROAD	0.078640	SPB	0.306375	PVSG	0.03825
Ru#1	103060620	chronic	100.893	-0.71112	2007-02-03	2007-04-02	K6	V	15.365	0.177	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	ROAD	0.081138	DISCUT	0.280114	BCEP	0.109914
Ru#1	103060640	nonchronic	100.893	-0.68342	2007-02-03	2007-04-02	G8	V	14.236	0.064	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	PVSG	0.27466	ROAD	0.279175	BCEP	0.049194
Ru#1	103060675	chronic	100.896	-0.74068	2007-02-03	2007-04-02	K7	V	14.019	0.140	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	PVSG	0.160235	PVSG	0.160235	LEV	0.066334
Ru#1	103061109	nonchronic	100.907	-0.71021	2007-02-03	2007-04-02	G6	V	15.060	0.748	FITS	FITS	<input type="checkbox"/>	<input type="checkbox"/>	VOtable	VO	PVSG	0.177291	BE	0.147663	ROAD	0.178240

Fig. 2 Output of the query

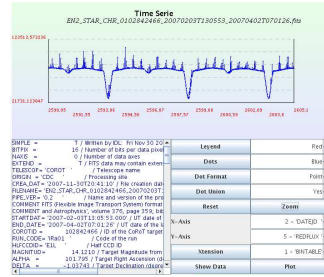


Fig. 3 Light curve and FITS header visualization

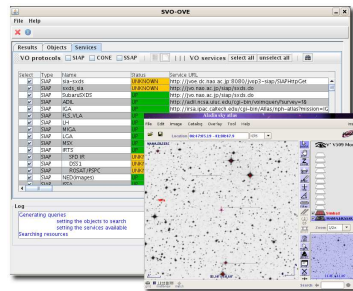


Fig. 4 Results obtained using the VO discovery tool implemented in the system

Acknowledgements This research has made use of the Spanish Virtual Observatory supported from the Spanish MEC through grants AyA2008-02156, AyA2005-04286