



Kanzelhöhe Online Data Archive “KODA”

1. Introduction, purpose and goal:

KODA is the public portal to all main Kanzelhöhe data (White-Light -, H-Alpha -, CaII-K full disk solar images). The purpose of KODA is to provide online access to synoptic as well as high-cadence archive data. The overall goal of KODA is to share the data produced by Kanzelhöhe Observatory with the solar physics community and to improve data accessibility and data dissemination.

In the following we describe the technical aspects of KODA. The KODA webpage can be found under <http://kanzelhohe.uni-graz.at/>.

2. Technical Aspects:

The core of KODA is a SUN file server located in Graz. The server is configured as a **SAMP** system (**S**olaris operating system, **A**pache web server, **M**ySQL database server and **P**HP). KODA is a web database capable to answer SQL queries relevant to data of Kanzelhöhe observatory.

The SQL query is based on the selected archive, data set(s), image format and the requested time interval. The result of the SQL query is a list of solar images that meet the selection criteria. Figure 1 summarizes the 3 main operations relevant to the KODA system.



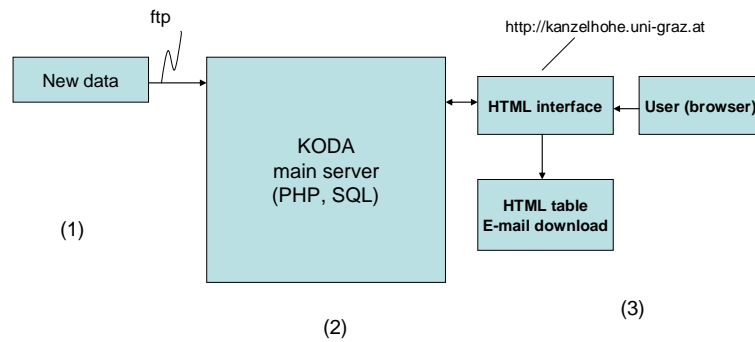


Figure 1

- (1) New Data (images) from Kanzelhöhe Observatory is periodically downloaded via ftp
- (2) KODA main server. Besides image data KODA stores the corresponding metadata in a SQL database (MySQL in our case). Update scripts check for new data and updates the MySQL database
- (3) A web user selects archive, data set(s), time interval, display options etc via the HTML interface. Via the HTML interface the user queries the SQL database and retrieves the result set as an HTML table. Optionally, the user can download the selected images via e-mail notification.

2.1 Current Software Versions:

- SUN/Solaris 10 x86 platform
- PHP 5.2.6
- Apache 2.2.9
- MySQL 4.1

The PHP configuration file, `php.ini`, can be found under `/opt/coolstack/php5/lib`. The Apache configuration file, `httpd-vhosts.conf`, can be found under `/opt/coolstack/apache2/conf/extra`.

3. Implementation details

4.1 Cron jobs

UNIX cron jobs at KODA (Werner) periodically download new data from Kanzelhöhe Observatory via the ftp protocol. Perl-sql scripts in the directory `/home/wom/keas_perl_scripts` regularly check data directories on KODA (Scanned Sunspot-Drawings, White-Light, H-alpha, Caii-K) if new data is available. If yes, other perl scripts update the KEAS database by inserting metadata (filename, date, image type etc) into the appropriate data tables (see appendix I). Specifically, these are the perl files in the directory `keas_perl_scripts`:



```
all_draw_syn_cron.pl
draw_syn2.pl
all_caiik_syn_cron.pl
caiik_syn.pl
all_halpha2_syn_cron.pl
halpha2_syn2.pl
all_halpha3_syn_cron.pl
halpha3_syn.pl
all_phokad_syn_cron.pl
phokad_syn4.pl
```

A shell script `/home/wom/kanzelhohe_tar.sh` checks every 30 minutes the `/data/download_kanzelhohe` directory if user requested image files. If yes, these image files will be packed into a tar file and the user is notified by an e-mail containing a download-link to the tar file. In fact, the shell script executes 2 different files.

1. `tar_text_file.pl`, which regularly checks `/data/download_kanzelhohe` for user-requested image files and is in charge of making the tar-file
2. `send_tar_file.php`, which notifies the user by e-mail that the tar-file is ready for download.

4.1 Program flow

In the following the basic functionality of the individual program files is described. For more comments and full details look at the program source code (see appendix I). All of the program files are located at `/opt/coolstack/apache2/kanzelhohe-htdocs`.

`index.html`

Homepage. A web user selects the synoptic or high-cadence archive. Representative images of KODA are shown.

`synoptic.html`

Tabular overview of available synoptic data sets, data availability, and image formats. A user can select one or more data sets.

`high_cadence.html`

Tabular overview of available high-cadence data sets, data availability, and image formats. A user can select a data set.

4.1.1 Synoptic branch:

`synoptic_select.php`



According to the selected (synoptic) data set(s) this php script presents the appropriate time interval and (in case of more than one selected data sets) computes overlapping start and end date

`synoptic_display.php`

Depending on the chosen display option this php script includes the script `synoptic_request.php` (display option: contrast compensated) or `synoptic_request_multiple.php` (display option: full disk)

`synoptic_request.php`

According to the selected time interval, display option, and image format this php script queries the KEAS database and presents the results in HTML form. The user is given the option to make a tar archive of the image files and get it via e-mail download.

`synoptic_request_multiple.php`

According to the selected time interval, display option, and image format this php script queries the KEAS database and presents the results in HTML form. The user is given the option to make a tar archive of the image files and get it via e-mail download.

`synoptic_email.php`

Display option: contrast compensated. If the user provides a valid e-mail address this php-script responds to the user that his/her request has been successfully submitted and that he/she will soon (max. 30 min) get an e-mail containing a link to the tar archive.

`synoptic_email_multiple.php`

Display option: full disk. If the user provides a valid e-mail address this php-script responds to the user that his/her request has been successfully submitted and that he/she will soon (max. 30 min) get an e-mail containing a link to the tar archive.

4.1.2 High-Cadence branch:

`high_cadence_select.php`

Depending on the selected (high-cadence) data set this php script presents to the user the appropriate time interval. The user is informed of the large amount of data per day and asked to narrow down the time interval.

`high_cadence_request.php`



According to the chosen time interval this php script selects the image files and presents the result as an HTML table in jpg (for a quick preview) and fits format. The user is given the option to make a tar archive of the fits files and get it via e-mail download.

high_cadence_email.php

If the user provides a valid e-mail address this php-script responds to the user that his/her request has been successfully submitted and that he/she will soon (max. 30 min) get an e-mail containing a link to the tar archive.

5. Demonstration and Help details

The following screenshots demonstrate the use of KODA and give some Help details.

Step 1: At the homepage (<http://kanzelhoe.uni-graz.at>) the user can select an **archive** (synoptic or high-cadence).

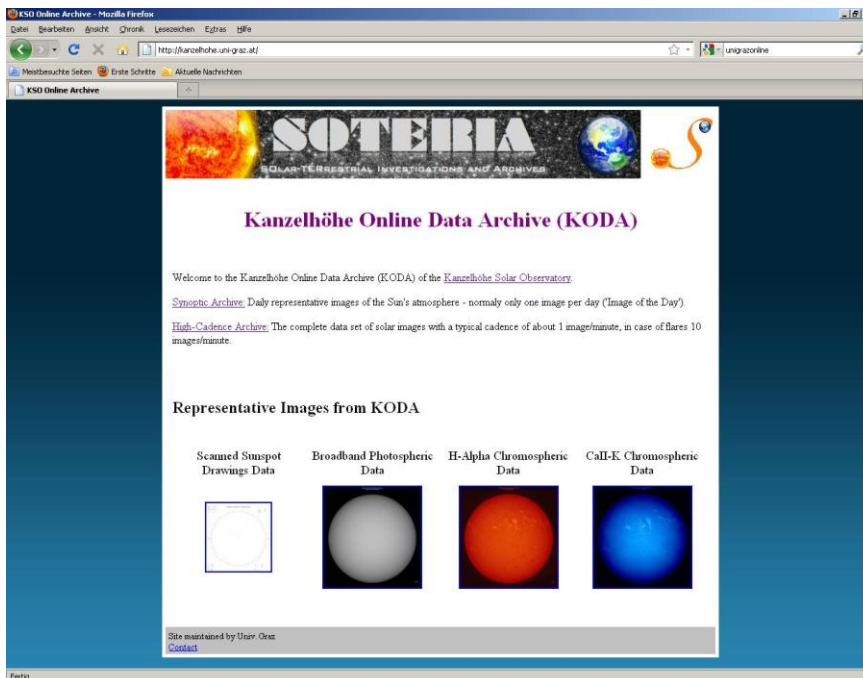


Fig 1: Homepage of KODA. The user selects an archive

Step 2: For the selected archive (here synoptic) the user gets a tabular overview of the available data sets, data availability and image formats. The user selects one or more data sets.



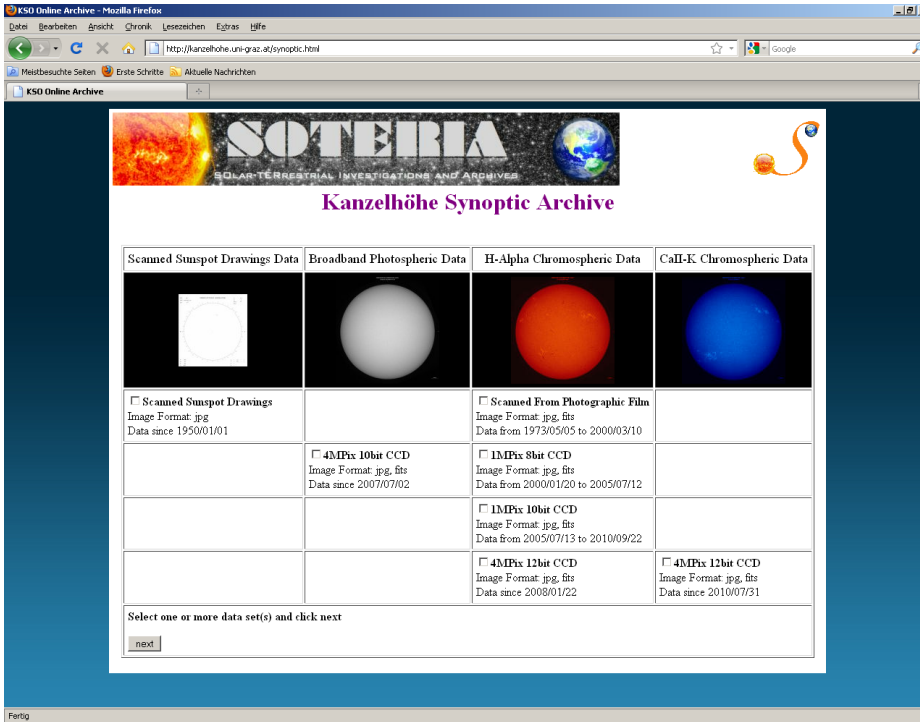


Fig 2: Overview of data sets, data availability, and image formats

Step 3: In order to retrieve a (common) time interval of the selected data sets the user selects **Start Date** and **End Date**. The user may choose an image format and/or a display option. In order to send the sql query to the database management system the user hits the **Submit** button.

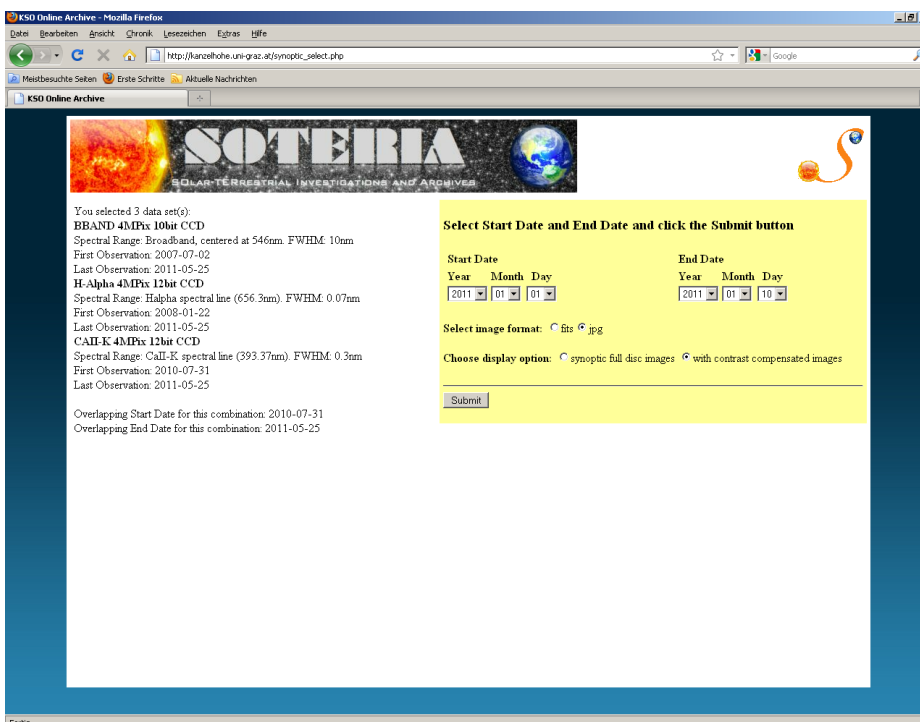


Fig 3: The web user selects a time interval



Step 4: The result of the query. The user is presented with an HTML table of images that meet his/her selection criteria. The user can inspect individual images via the thumbnails or download them by clicking on the URL link.

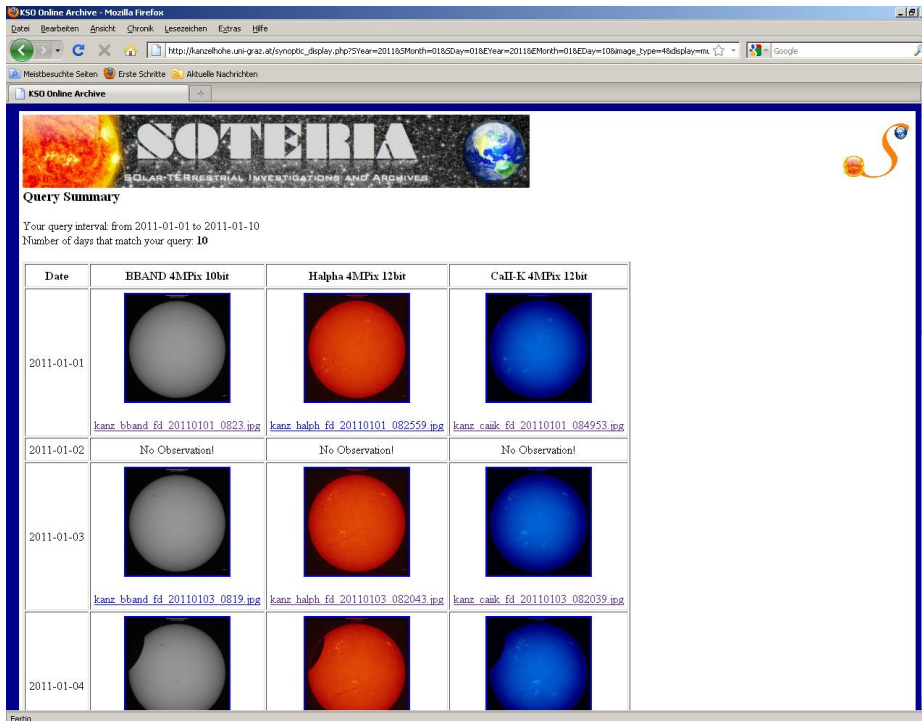


Fig 5: Result HTML table for the selected data sets and selected time interval

Step 5: Optionally, the user has the option to download the selected images as a tar file via email notification.



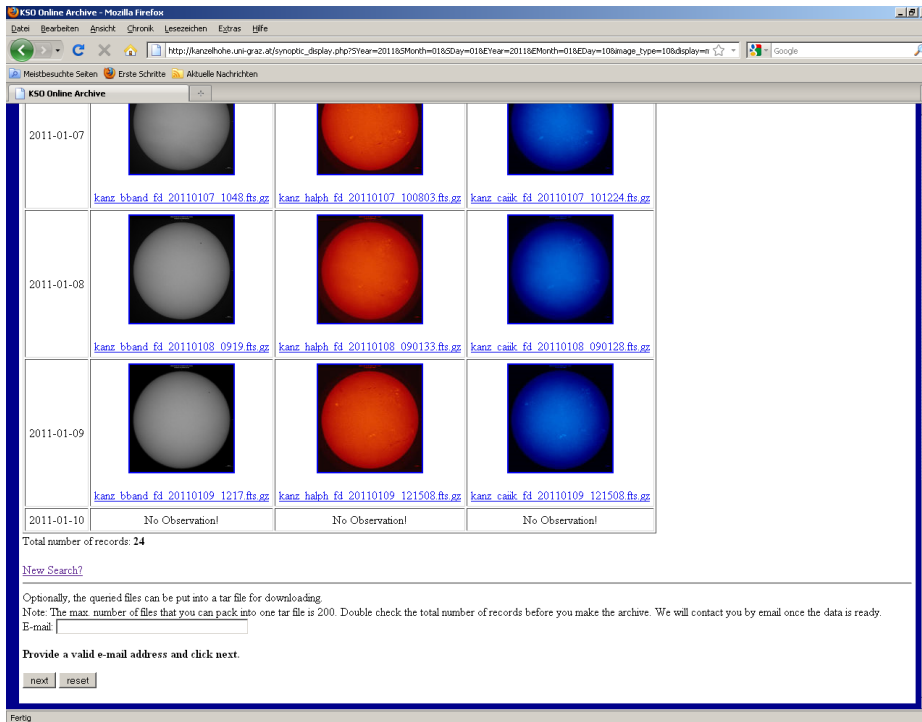


Fig 6: User provides e-mail address for data download

Future tasks:

Include /phoka dataset. Try to expand the download limit. It is currently 200 fits files corresponding to about 1Gbyte.

