DASCH Plug-In for VStar

DASCHObservationSource is a VStar observation source plug-in tool which reads DASCH (Digital Access to a Sky Century @ Harvard) data from an input source in tab-delimited "Starbase table" (.txt)) format. See bugs-and-features #439 on SourceForge for VStar. More information is available at http://dasch.rc.fas.harvard.edu/project.php.

Install the DASCH plug-in by going to the *Tool* menu and selecting *Plug-in Manager*. AAVSO login is required. Scroll to and select DASCH file reader and click on Install. After installation, restart VStar.

To obtain a DASCH data file, go to the web page http://dasch.rc.fas.harvard.edu/lightcurve.php

Enter a J2000 object position or a SIMBAD-searchable reference in the box and press "Search" to deliver the query results in a separate window.

As an example, entering "XX Dor" tells the search facility to search for variable stars using the APASS Input Catalog (B-band) for that object. Other catalogs include the Kepler Input Catalog (KIC), DASCH

object, and GSC2.3.2 catalog. Additionally, J2000 RA/DEC coordinates (e.g., 8 41 43.8 +19 43 33.5) are valid identifications. The resulting window containing three frames is produced.

DASCH (apass) Catalog Query Results (5")

'XX Dor' ra: 04:59:13.6 dec: -69:35:43 approx. plates: 3638

arcsec	Nobs	Nplot	mag	id (nearbyObjects [(mag)] [:object_typ
0	3879	3066	11.82	APASS_J045913.6-693543 (XX Dor:RRC @ 0.3)
1	2	2	11.86	APASS_J045913.7-693542 (XX Dor:RRC @ 1.5)

Display this table as a text file
Display this table as a VOTable
Download all points in table form.

Click on a point in the plot in the upper right panel and the object image will appear here.

Select an object from the upper left panel and a plot of the DASCH magnitu measure will appear here.

http://dasch.rc.fas.harvard.edu/lightcurve_frame.php?coo=XX+Dor&nmin=1&box=5&source=apass&frameformat=frame&submit=Search   1/1

In the top left hand frame, three sets of results and some display / download options are shown. Choose the option "Download all points in table form", and the resultant page lists several file options (A - H) for each of the three result sets.

DASCH
Digital Access to a Sky Century @ Harvard
A New Look at the Temporal Universe

Data Release Description   Search Magnitudes and Lightcurves   Search Images   Project Page

DASCH Photometry Data for Catalog Query

DASCH lightcurve data is presented as a tab-delimited ASCII "Starbase" table format or as a VOTable suitable for loading into VO tools such as topcat.

Starbase tables may be displayed in the browser window or downloaded as a gzipped file. Tables may be displayed in short or long form. The following columns appear in the short form table.

Date	Heliocentric Julian Date
year	Ephemeris Date
magcal_magdep	DASCH magnitude.
magcal_local_rms	Magnitude error estimate.
limiting_mag_local	Limiting magnitude estimate.
ra	Right Ascension in degrees
dec	Declination in degrees
THETA_J2000	Image angle in degrees East of North.
ELLIPTICITY	1- ((image width)/(image length))
Plate	Plate identification
versionId	Photometry pipeline version tag
AFLAGS	Photometry warning flags
AFLAGSBits	Bits set in photometry warning flags
BFLAGS	Photometry processing flags
BFLAGSBits	Bits set in photometry processing flags
quality	Plate quality flags
qualitybits	Bits set in plate quality flags
timeAccuracy	Accuracy of logbook time in days

The following tables list all observations in summary form.

The full listing shows all of the observation measurement parameters stored in the DASCH photometry database. See the database contents page for definitions of column headers.

Note that the "quality" and "mosaicNumber" are invalid for catalog query data. Lightcurves of unmatched catalog points may not be complete near the edge of the search radius.

The following list provides six options for each object return by the catalog query. The file names use the form "(search center)_(catalog designation)_(distance from the search center in arcsec)"

- A: Short form Starbase (tab-delimited ASCII) table for display in the browser window
- B: Short form Starbase table for download as a text file

- C: Short form Starbase table for download as a gzipped file
- D: Short form VOTable for download as a gzipped XML file
- E: Long form Starbase table for display in the browser window
- F: Long form Starbase table for download as a text file
- G: Long form Starbase table for download as a gzipped file
- H: Long form VOTable table for download as a gzipped XML file

If there are more than one query objects, the end of the list provides ways to download all of the results in a single Starbase or xml table or to download all of the Starbase or xml files in a single tarball. Note that the TOPCAT Virtual Observatory tool can read gzipped XML files.

XX_Dor_APASS_J045913.6-693543_0000 with 3879 points at 0 arcsec from search center
A: short_XX_Dor_APASS_J045913.6-693543_0000.db
B: short_XX_Dor_APASS_J045913.6-693543_0000.txt
C: short_XX_Dor_APASS_J045913.6-693543_0000.db.gz
D: short_XX_Dor_APASS_J045913.6-693543_0000.xml.gz
E: XX_Dor_APASS_J045913.6-693543_0000.db
F: XX_Dor_APASS_J045913.6-693543_0000.txt
G: XX_Dor_APASS_J045913.6-693543_0000.db.gz
H: XX_Dor_APASS_J045913.6-693543_0000.xml.gz

XX_Dor_APASS_J045913.7-693542_0001 with 2 points at 1 arcsec from search center
A: short_XX_Dor_APASS_J045913.7-693542_0001.db
B: short_XX_Dor_APASS_J045913.7-693542_0001.txt
C: short_XX_Dor_APASS_J045913.7-693542_0001.db.gz
D: short_XX_Dor_APASS_J045913.7-693542_0001.xml.gz
E: XX_Dor_APASS_J045913.7-693542_0001.db
F: XX_Dor_APASS_J045913.7-693542_0001.txt
G: XX_Dor_APASS_J045913.7-693542_0001.db.gz
H: XX_Dor_APASS_J045913.7-693542_0001.xml.gz

Table of all the data:
A: short_output_lI9Wow.db
B: short_output_lI9Wow.txt
C: short_output_lI9Wow.db.gz
D: short_output_lI9Wow.xml.gz
E: output_lI9Wow.db
F: output_lI9Wow.txt
G: output_lI9Wow.db.gz
H: output_lI9Wow.xml.gz

Collections of the above Files
B: short_all_txt_lI9Wow.tar
C: short_all_db_lI9Wow.tar
D: short_all_xml_lI9Wow.tar
F: all_txt_lI9Wow.tar
G: all_db_lI9Wow.tar
H: all_xml_lI9Wow.tar
Return to DASCH Home Page

This plug-in is designed to read files of type A, such as "short_XX_Dor_APASS_J045913.6-693543_0000.db".

The plug-in can read this either as a local file on your PC or Mac (once you download it), or as the appropriate URL, in this case:

http:// dasch.rc.fas.harvard.edu/tmp/rv1tC9/short_XX_Dor_APASS_J045913.6-693543_0000.db.

Note that these URLs are available only on a temporary basis. Other instances of the same query may produce a different URL. Downloading a file to your PC looks like:

```
title  Photometry data for APASS_J045913.6-693543 from search centered on XX_Dor using the apass
calibration catalog
REF     Date     year    magcal_magdep    magcal_local_rms      limiting_mag_local      ra      dec
THETA_J2000     ELLIPTICITY    Plate   versionId      AFLAGS   BFLAGS  quality timeAccuracy
AFLAGSBits      BFLAGSBits     qualitybits    catalogNumber
---     ----     ----    -------------    ----------------      ------------------      --      ---
-----------     -----------    -----   ---------      ------   ------  ------- -----------     -----
-----    ----------     -----------    -------------
APASS_J045913.6-693543  2411298.814265   1889.809080      12.04    0.16    14.51   74.80344
-69.59726       -48.4    0.142   b04502  130     524416  1483607040      584     0.000700        7,19
10,11,17,18,19,21,22,27,28,30   3,6,9   2
APASS_J045913.6-693543  2411298.849584   1889.809177      12.01    0.17    14.20   74.80366
-69.59716       85.3     0.246   b04503  130     524288  1349388288      512     0.000700        19
11,17,18,19,21,22,28,30 9       2
APASS_J045913.6-693543  2411322.750550   1889.874659      11.47    0.24    12.43   74.80212
-69.59705       -74.0    0.163   b04638  130     268959744       1349124098      640     0.000700
19,28   1,17,19,21,22,28,30     7,9     2
APASS_J045913.6-693543  2411621.896002   1890.694236      12.21    0.13    14.29   74.80271
-69.59693       -74.8    0.133   b05710_s1       130     524416  1349386240      641     0.000000
7,19    17,18,19,21,22,28,30    0,7,9   2
APASS_J045913.6-693543  2411621.896002   1890.694236      12.18    0.21    14.85   74.80295
-69.59711       81.8     0.305   b05710  130     524416  1349389312      641     0.000700        7,19
10,11,17,18,19,21,22,28,30      0,7,9   2
APASS_J045913.6-693543  2411623.909577   1890.699752      12.11    0.12    14.72   74.80288
-69.59722       -0.7     0.166   b05720  130     524288  1349388288      512     0.000700        19
11,17,18,19,21,22,28,30 9       2
APASS_J045913.6-693543  2411635.867388   1890.732513      11.43    0.12    13.67   74.80313
-69.59736       0.7      0.099   b05814  130     524288  1349386240      640     0.000700        19
17,18,19,21,22,28,30    7,9     2
APASS_J045913.6-693543  2412371.816462   1892.746766      11.90    0.25    13.10   74.81953
-69.59784       -87.1    0.613   b08672  136     281575552       1080690691      4625    0.007500
7,15,19,22,23,28        0,1,11,17,19,21,22,30   0,4,9,12        2
APASS_J045913.6-693543  2412446.499690   1892.950819      11.54    0.28    14.52   74.80774
-69.59709       -69.1    0.591   b08872  136     9962112 1886260226      593     1.000000
7,9,19,20,23    1,10,11,17,18,19,21,22,28,29,30 0,4,6,9 2
APASS_J045913.6-693543  2412697.848381   1893.639311      12.14    0.15    16.29   74.80265
-69.59709       -83.0    0.131   b10208  136     524416  1349389312      593     0.000700        7,19
10,11,17,18,19,21,22,28,30      0,4,6,9 2
APASS_J045913.6-693543  2412722.866254   1893.707853      12.24    0.29    15.86   74.80277
-69.59723       -19.7    0.207   b10273  136     268959872       1345192960      721     0.007500
7,19,28 10,17,18,19,21,28,30    0,4,6,7,9       2
APASS_J045913.6-693543  2413087.807007   1894.707690      11.41    0.11    13.22   74.80363
-69.59707       39.5     0.364   b12192  136     268992640       1076494336      657     0.000700
7,15,19,28      17,19,21,30     0,4,7,9 2
APASS_J045913.6-693543  2413119.837804   1894.795446      12.01    0.17    15.13   74.80258
-69.59683       50.3     0.149   b12324  136     524416  1349388288      529     0.000700        7,19
11,17,18,19,21,22,28,30 0,4,9   2
APASS_J045913.6-693543  2413142.757446   1894.858240      11.48    0.24    11.83   74.80297
-69.59724       29.6     0.324   b12458  136     269000832       1080688640      657     0.000700
7,13,15,19,28   17,19,21,22,30  0,4,7,9 2
APASS_J045913.6-693543  2413176.648315   1894.951091      12.45    0.14    12.54   74.79890
-69.59381       -45.6    0.455   b12705  136     344498304       1080688643      657     0.000700
7,13,15,19,23,26,28     0,1,17,19,21,22,30      0,4,7,9 2
APASS_J045913.6-693543  2413479.796414   1895.781634      12.04    0.07    13.43   74.80319
-69.59705       -51.1    0.626   b14818  136     524416  1349386240      4753    0.000700        7,19
17,18,19,21,22,28,30    0,4,7,9,12      2
APASS_J045913.6-693543  2413479.805764   1895.781660      12.21    0.10    14.99   74.80310
-69.59700       -2.2     0.156   b14819  136     524416  1349389312      593     0.000700        7,19
10,11,17,18,19,21,22,28,30      0,4,6,9 2
APASS_J045913.6-693543  2413479.839698   1895.781753      11.69    0.05    13.34   74.80354
-69.59684       46.5     0.450   b14823  136     524416  1349388288      529     0.000700        7,19
11,17,18,19,21,22,28,30 0,4,9   2
APASS_J045913.6-693543  2413482.707514   1895.789610      12.07    0.14    12.97   74.80239
-69.59680       33.9     0.530   b14869  130     524416  1483603968      648     0.000700        7,19
```

In VStar, to use this plugin, select "New Star from DASCH file …" from the *File* menu. The plugin will display a dialog box, asking you to select a file or input a full URL. The DASCH data will then become available in VStar for analysis.

In the DASCH data, some of the observations show a "magErr" of 99, indicating that the observed magnitude lies beyond the range of the limiting magnitudes for the original plates. The plug-in flags these observations as "excluded. For the above example, the initial plot looks like the following, somewhat distorted by the resultant large error bars.
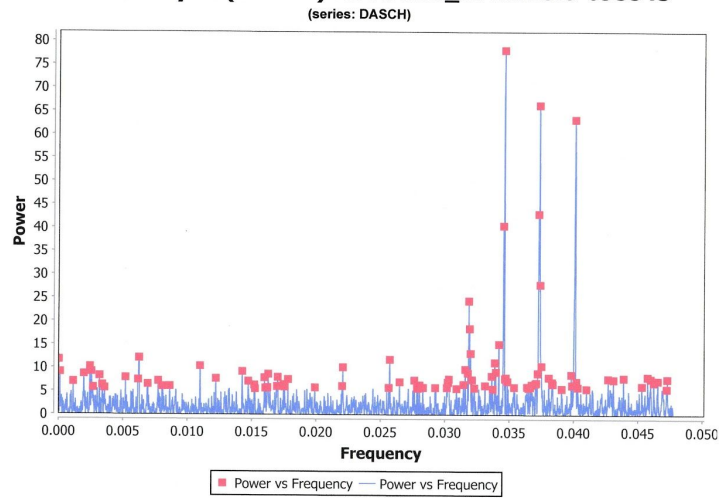
Light Curve for APASS_J045913.6-693543
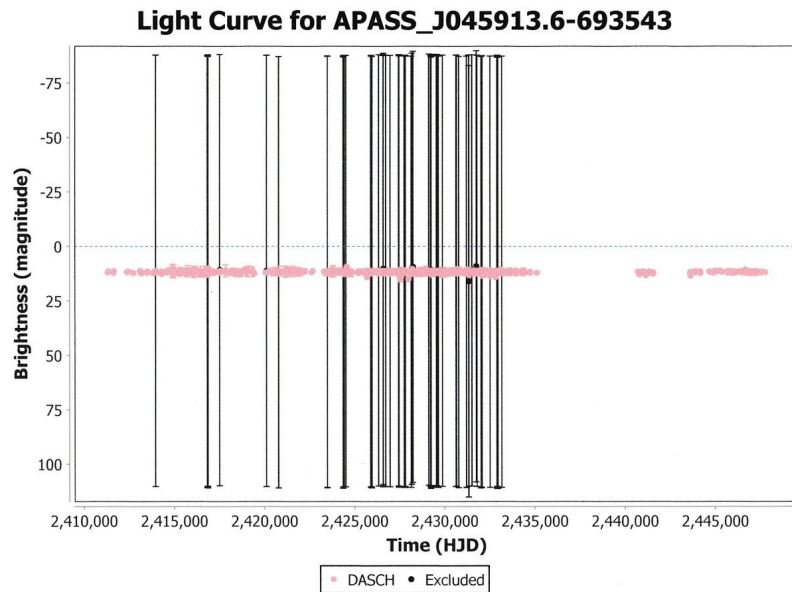
If you then select *Plot Control* from the *View* menu and un-check the "Excluded" box under Visibility of Data, the new plot will look much more "reasonable".

Light Curve for APASS_J045913.6-693543
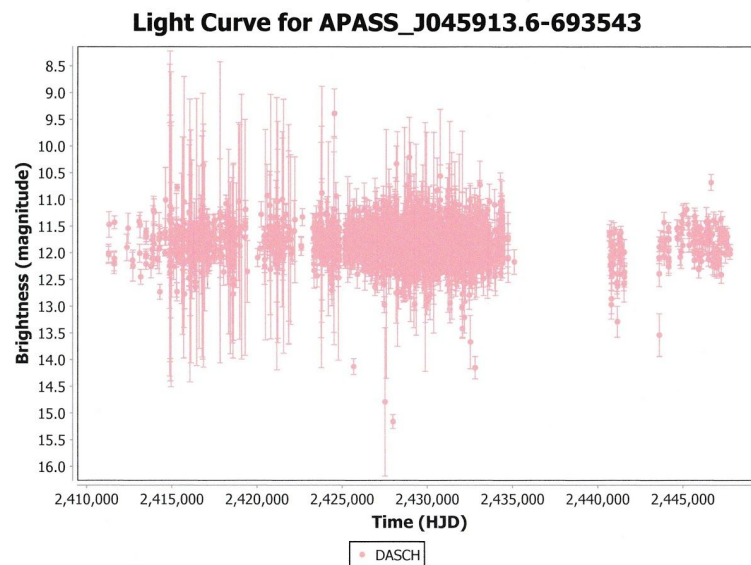
From there, a variety of analyses is available in VStar. For example, if period analysis is desired, go to the VStar *Analysis* drop down menu and select "DC DFT Standard Scan". This will yield:

Period Analysis (DC DFT) for APASS_J045913.6-693543

(series: DASCH)

Selecting the "Top Hits" option will yield the following phase plot.

Phase Plot for APASS_J045913.6-693543

period: 28.895203, epoch: 2429536.38835