Introduction to Catalogs_Plugin v1.00a

27 Sept 2021

This document is a short introduction to Catalogs_Plugin, a Java-based plugin for AstroImageJ to query on-line photometry databases. The output is an AstroImageJ-compatible radec file to overlay apertures on plate-solved images.
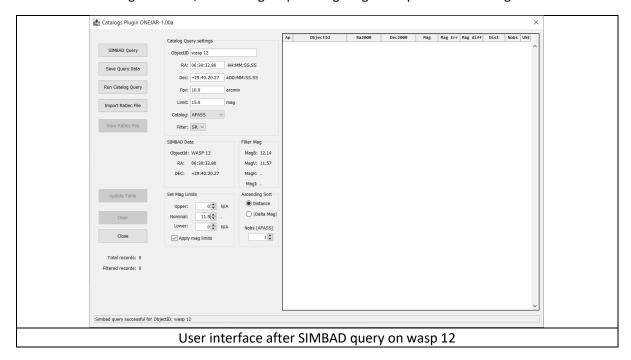
Version 1.00a supports the VSP and APSS9 on-line catalogs as listed below

Links:

AstroImageJ:	https://www.astro.louisville.edu/software/astroimagej/
Variable Star Plotter:	https://app.aavso.org/vsp/
VizieR: (hosts APASS9 catalog)	http://cdsarc.u-strasbg.fr/doc/asu-summary.htx

Run plugin from AstroImageJ toolbar

From the AstroImageJ toolbar, select Plugins | Catalog Plugin to open the following form:

User interface after SIMBAD query on wasp 12

Note: the plugin runs as a modal dialog and must be closed to access other AIJ software.

SIMBAD Query – runs an object name-based query on Simbad on-line database. If a match is found, populates SIMBAD Data section as shown for WASP-12. In this example, no data was returned for R and I magnitude bands.

Save Query Data – saves current Catalog Query settings to disk; reloads saved data when plugin is closed and re-opened

Run Catalog Query – runs an on-line query on the selected catalog (APASS9) with user parameters specified in Catalog Query settings section. The results of a successful query are tabulated on the right of the form, shown in the next section.
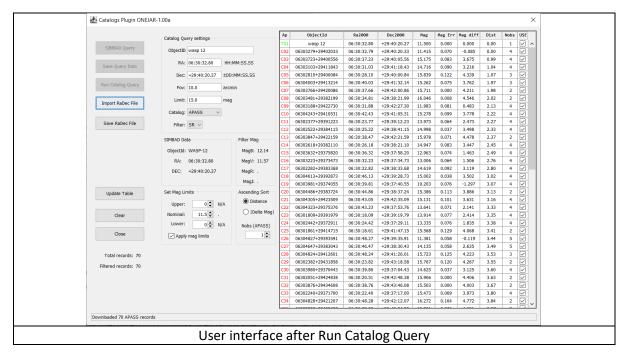
Note: Current version (1.00a) limits total number download records to 1500.

Import RaDec File – reads and displays radec file data.

Close – closes plugin, any unsaved data will be lost.

Run an on-line catalog query:

The figure shows the interface after downloading data from the APASS9 catalog. All 70 records matching the specified query parameters are tabulated, sorted by increasing radial distance from the object star.

User interface after Run Catalog Query

Ap – lists AstroImageJ aperture id

ObjectId – catalog object identifier.

Since records are not named in the APASS database, the plugin creates a unique identifier formatted HHMMSSSS±DDMMSSSS, as below for Ap C02

Ra200, Dec2000 – object coordinates

Mag, Mag Err – catalog magnitude values for selected filter band

Mag diff – difference between Catalog and Nominal magnitudes

Dist – radial distance (arcmin) to T01 object; by default, records are sorted by increasing radial distance.

Nobs – number of observations for each record (APASS)

USE – user selects or de-selects record to export to radec file.

Import RaDec File – over-writes current data with radec file data set.

Save RaDecFile – saves selected table data to AstroImageJ-compatible file <ObjectId>.<filter>.<fov>.radec.txt

Update Table – see below

Clear – clears table data
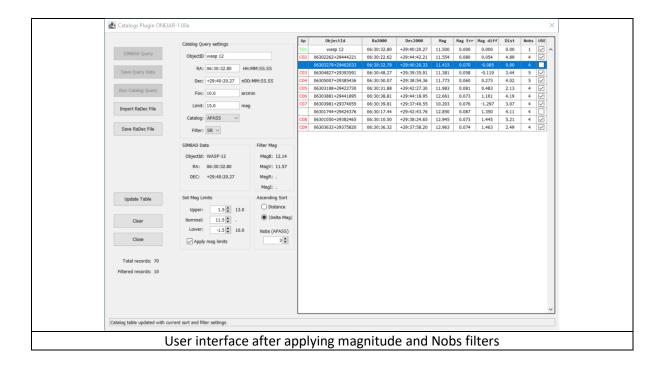
Apply user-selected filters and sort order:

The tabulated record count is reduced to 10 records after applying the following filters:

Nominal (target) mag set to 11.5 mag

Mag range: 11.5 ± 1.5

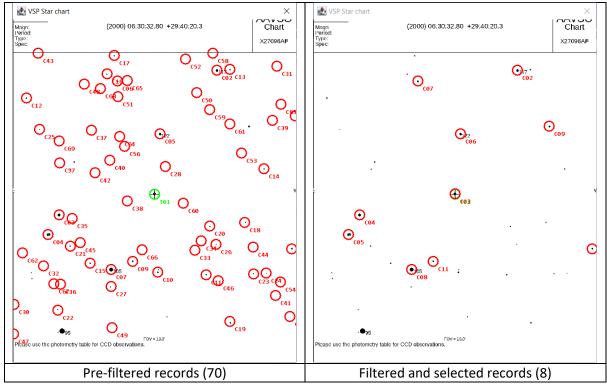Minimum number of observations: 3

Sort by: |Delta Mag|, i.e., by the absolute difference in comparison and nominal mag.

User interface after applying magnitude and Nobs filters

Update Table – applies selected sort order, magnitude and Nobs filter, selecting 10 of 70 records in this example.

USE – the figure shows two de-selected records with Ap column automatically entries updated accordingly.

VSP Chart

Pre-filtered records (70)	Filtered and selected records (8)

The left figure shows VSP chart opened after running a catalog query and the right figure after applying filter and user selections.

Save Radec File - saves the right-hand data set to a text file: wasp_12.SR.010.radec.txt

Example workflow

Open Catalogs_Plugin, enter ObjectId and run SIMBAD query to download coordinates and available magnitude data.

Input other Catalog Query settings and enter an estimate Nominal magnitude for this object, e.g., based on SIMBAD magnitude for that filter band.

Run Catalog Query to download all records matching query parameters. Set magnitude and Nobs (APASS catalog) filters and run Update as necessary until roughly 10 table records are displayed.

Review table and chart data to select or de-select table records. For example, in the filtered chart above, de-select C03 (overlaps target object) and (optionally) de-select the object at right edge of FOV.

Save chart data to radec file – the software automatically assigns filename with query-based format in radec subfolder.

Close Catalogs_Plugin, open a plate-solved image in AIJ image viewer, then import and over-lay apertures (File | Import Apertures from RA/DEC list .., navigate to and select radec file).

Option: to change selected aperture, re-open Catalogs_Plugin, run Import Radec File and open saved radec file to import table records. De-select any unwanted apertures and save changes.

Note: Save RaDec File over-writes without warning any radec file for the same query settings.