ASAS-SN Plug-in for VStar

Description: This plugin allows you to open text files in the formats of the All-Sky Automated Survey for Supernovae (ASAS-SN).
Currently (on 18 Apr 2023), ASAS-SN data comes in three formats. The first and oldest one is provided by the ASAS-SN Sky Patrol. The second format comes from the ASAS-SN Photometry Database and ASAS-SN Variable Stars Database. Those databases contain pre-computed light curves The newest ASAS-SN service, ASAS-SN Sky Patrol V2.0, provides the data in the third form.

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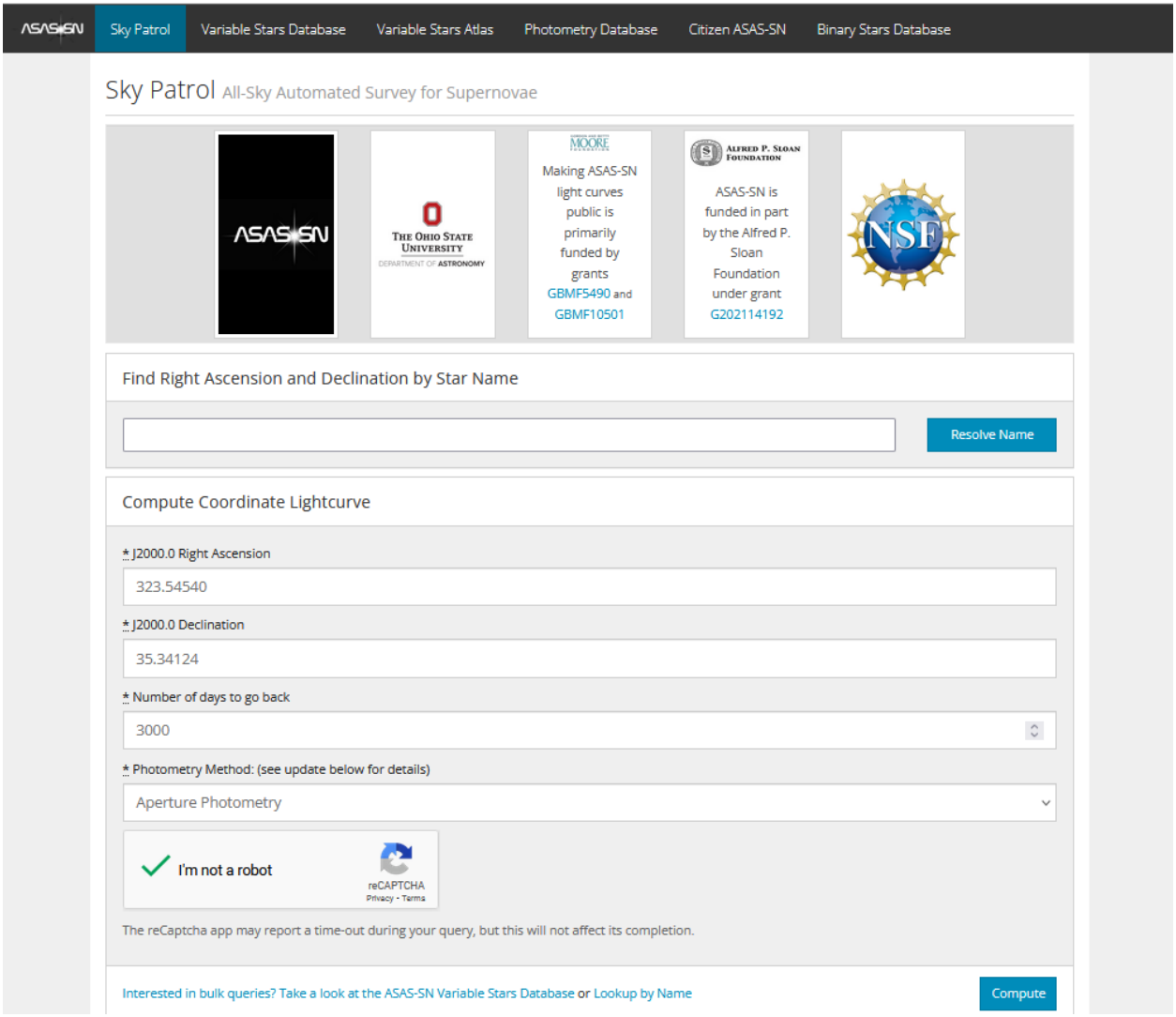
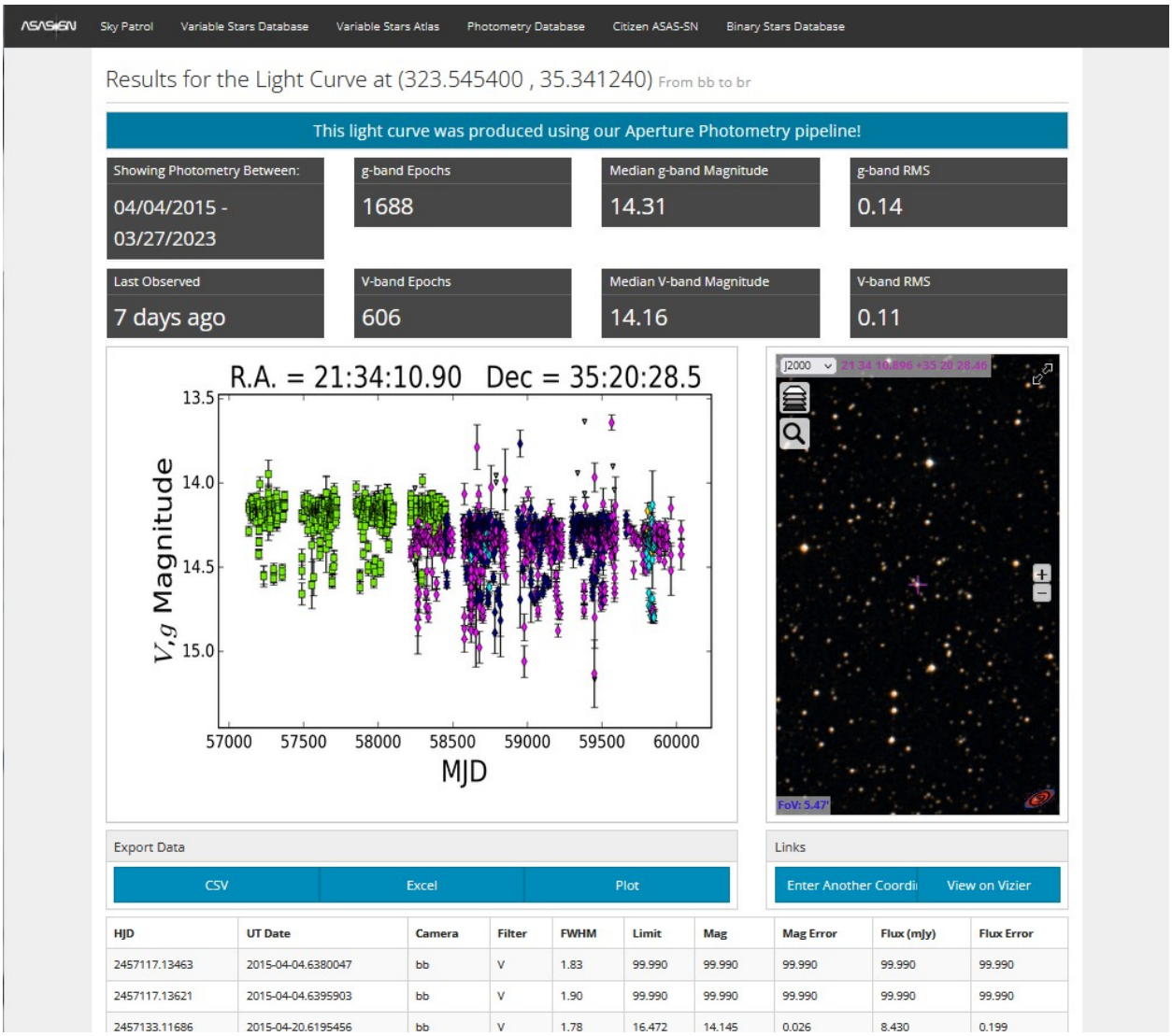
ASAS-SN Sky Patrol V1.0

ASAS-SN Sky Patrol data are computed in real-time using aperture photometry for a point on the celestial sphere for which ASAS-SN images exist. Go to the Sky Patrol website [https://asas-sn.osu.edu/], enter the coordinates of a target and the number of days to go back, then press [Compute]

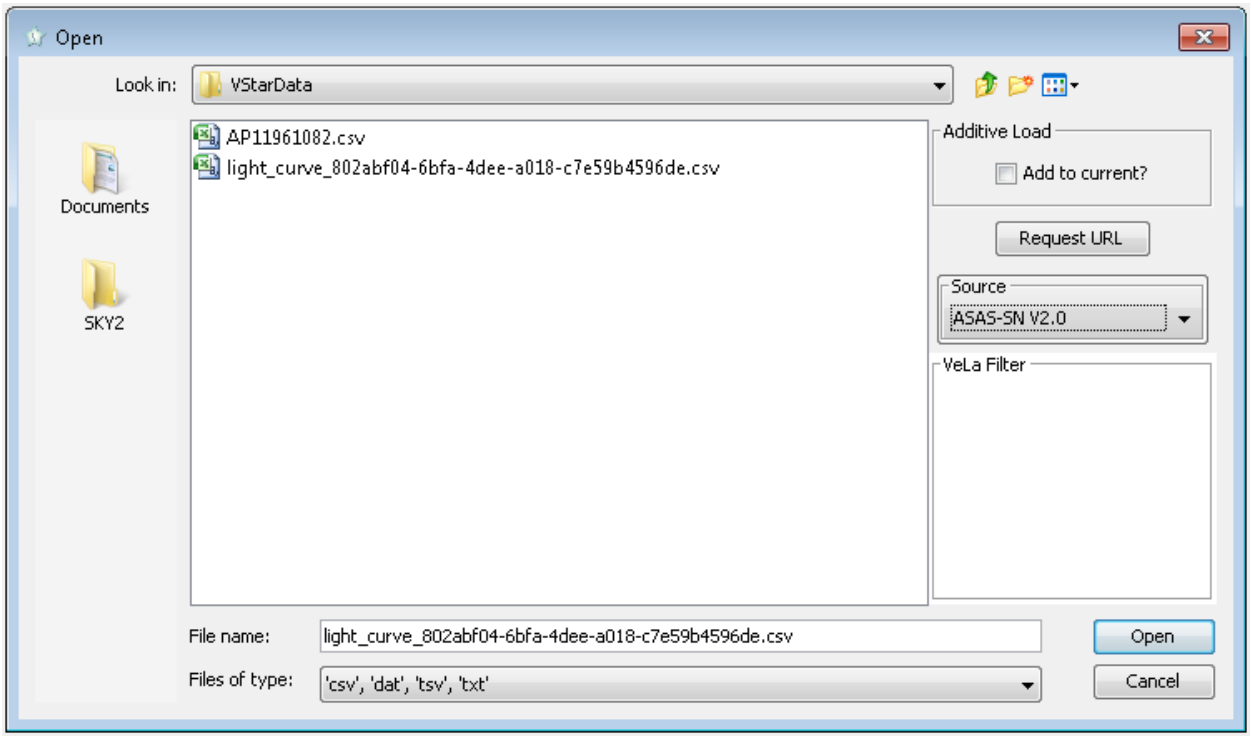


The calculations may take a while. When calculations succeed, you will be redirected to the result page.

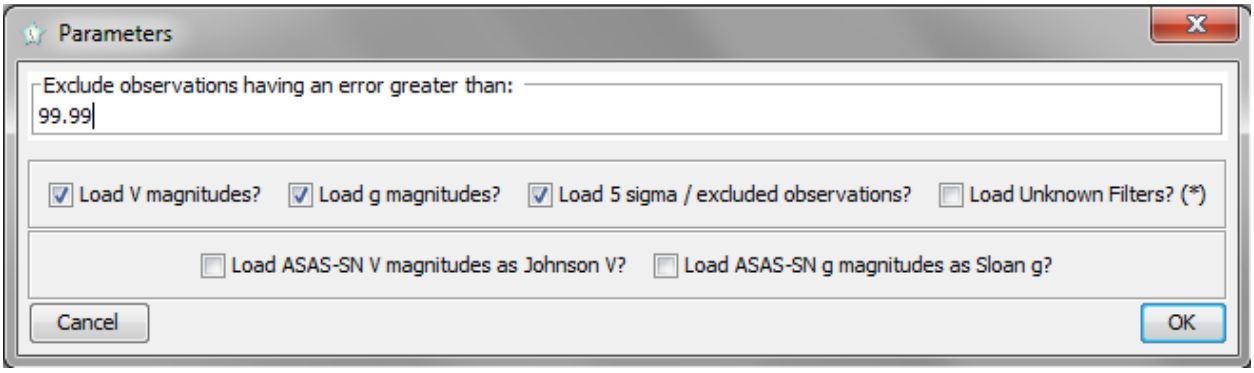


Press the [CSV] button under “Export Data” and save the CSV file to disk. The file contains V and g bands data, as seen from the preview plot.

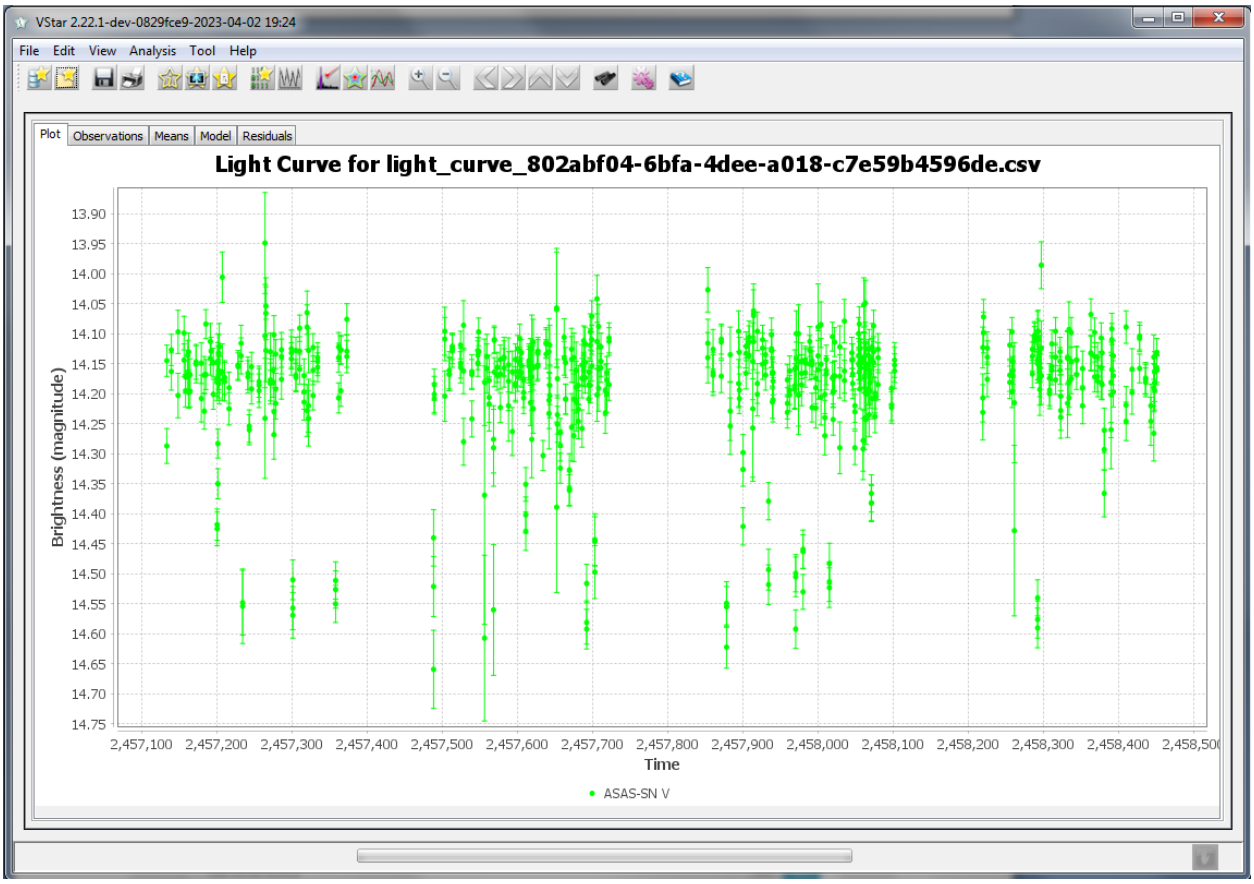
From VStar, select [New Star from File...] from the [File] menu and then select “ASAS-SN” in the “Source” dropdown list. Go to the location of the saved file and open it.



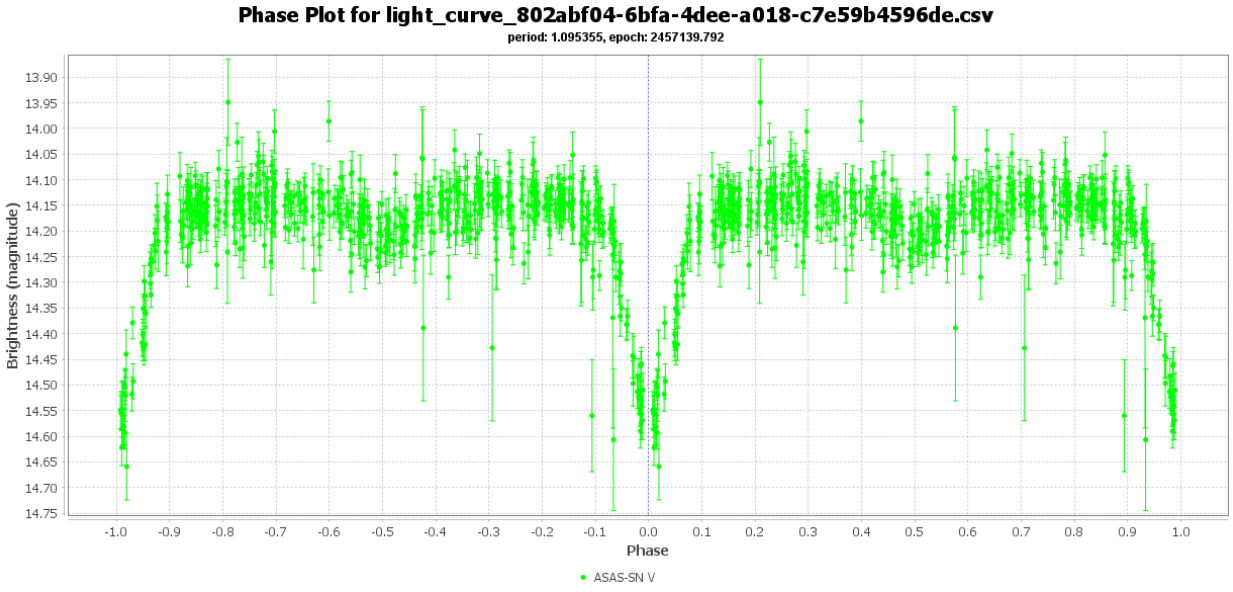
The following dialog will appear:



Currently, ASAS-SN light curves can contain data for V and g bands. Some observations in a file can be marked as unreliable (“5 sigma/excluded observations”); they can be excluded by unchecking the corresponding checkbox. A user can limit the maximum allowed uncertainty (“Exclude observations having an error greater than” field).
Select the data you need (let’s assume you have selected data for the V band only) and press OK. VStar will show you a light curve:

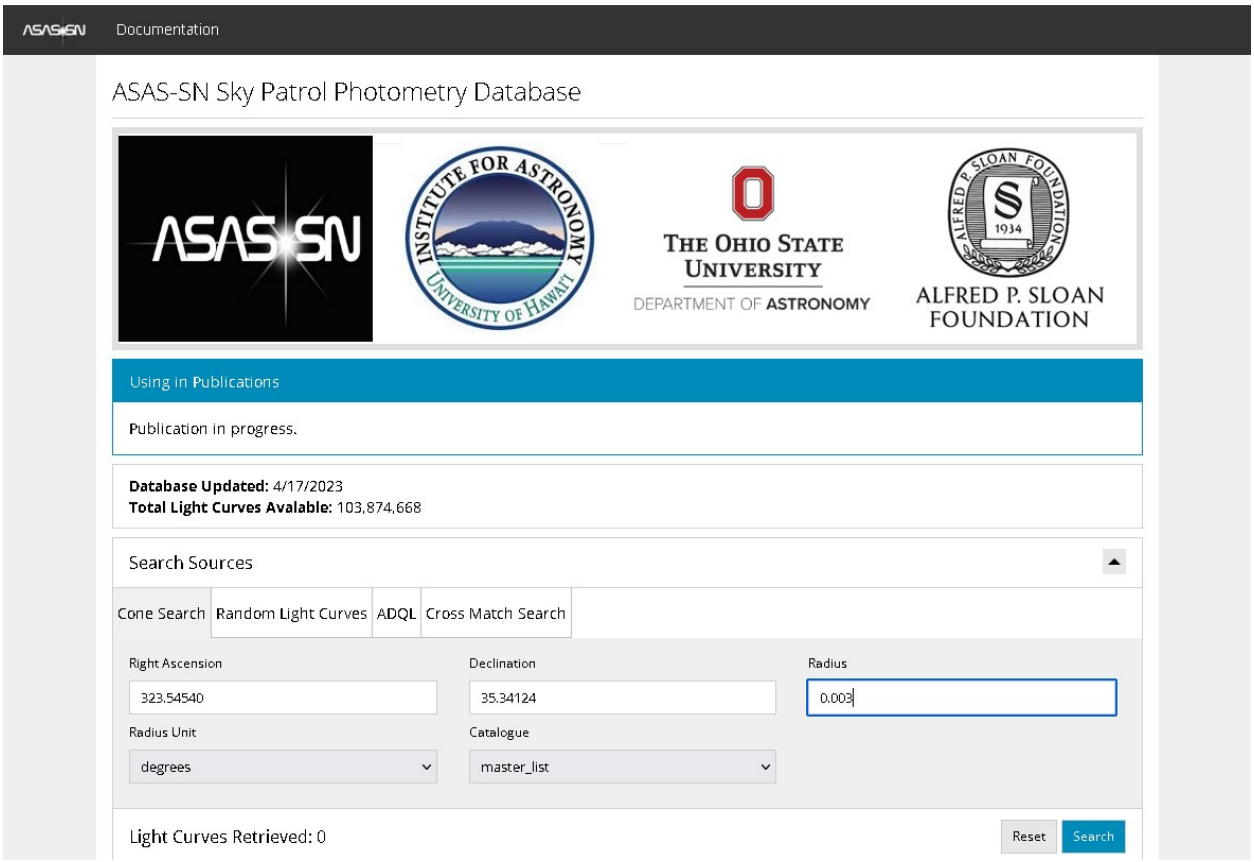


Here is the phase plot for the star (it is an eclipsing binary with a period of 1.095355 days:



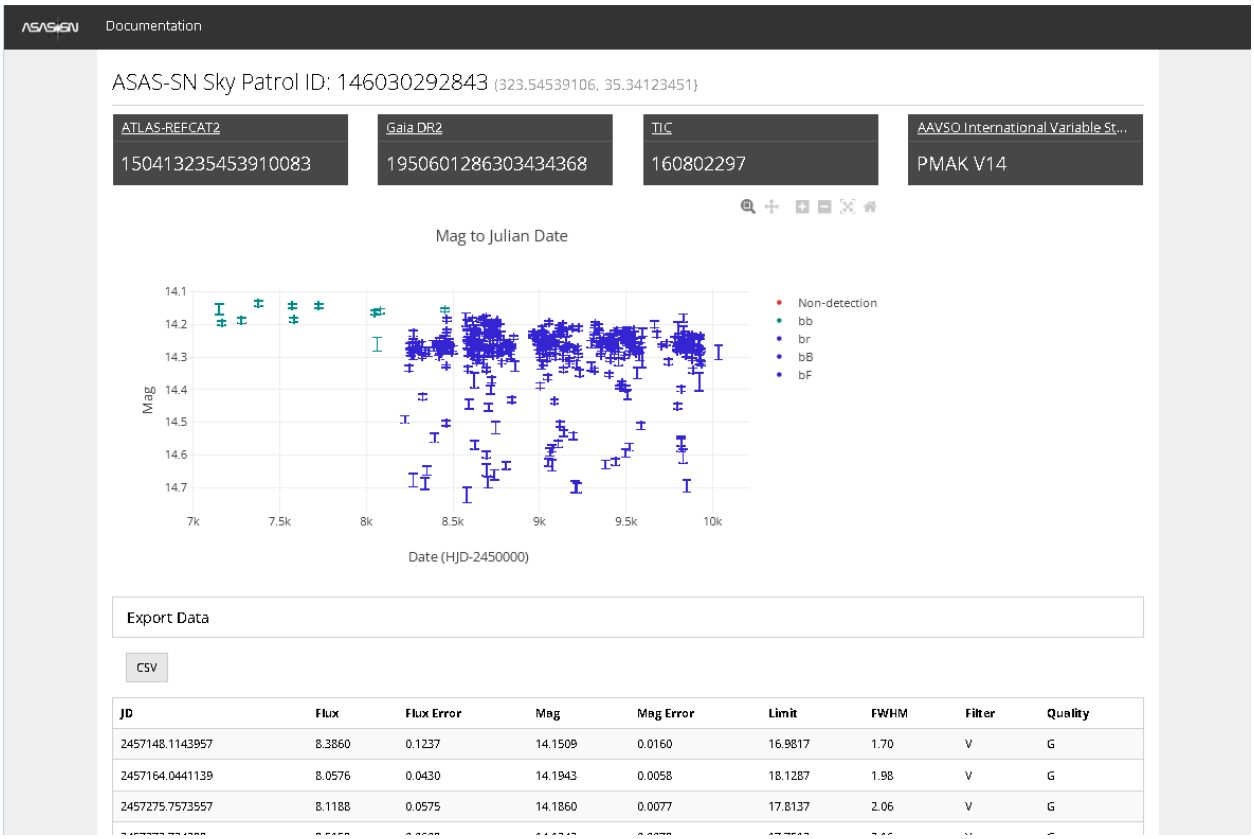
ASAS-SN Sky Patrol V2.0

The new ASAS-SN Sky Patrol V2.0, as it is claimed in [https://arxiv.org/abs/2304.03791], “not only serves pre-computed lightcurves for a select list of ~111 million targets, but it also continuously updates the lightcurves in real time.”
To find the light curve, go to http://asas-sn.ifa.hawaii.edu/skypatrol/. On the page, enter RA, Dec, and the search radius in the appropriate fields, then click [Search]:

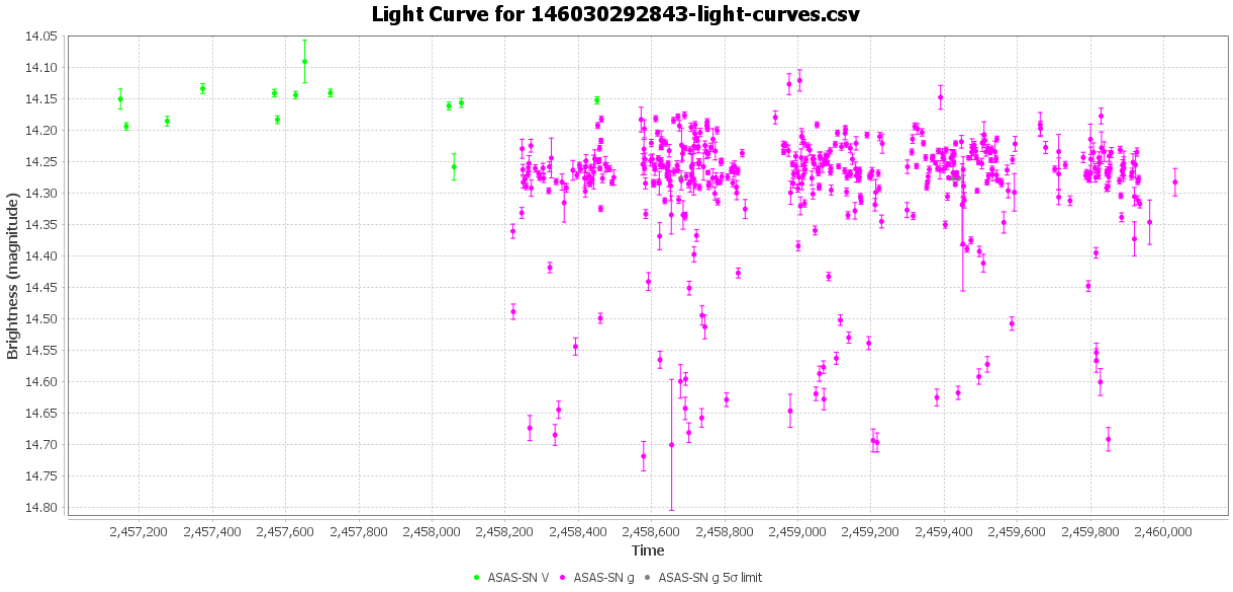


If the search is successful, you will see one or more links to the light curves:

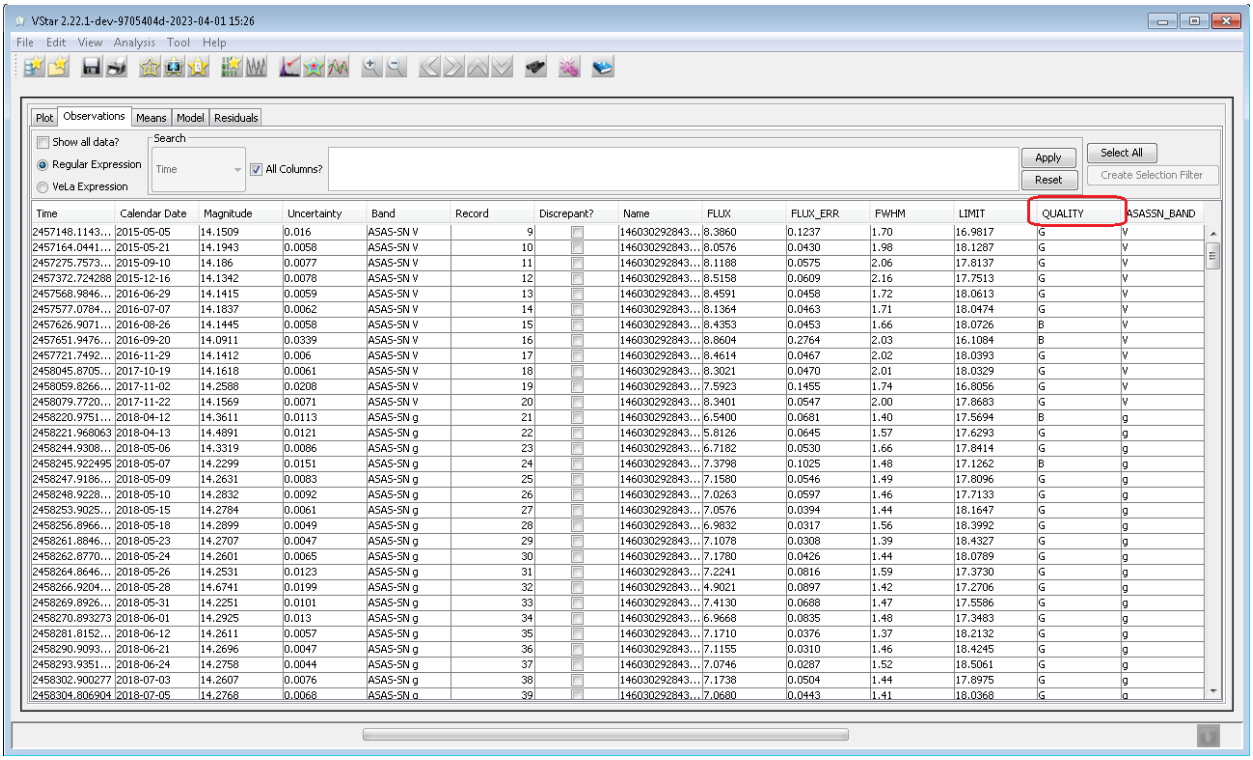
Click on a link, and you will be redirected to the light curve page. Click the [CSV] button to download the data:



Open the CSV file in the same way as described in the previous chapter (in this example, all three V, g, and 5-sigma checkboxes were checked):



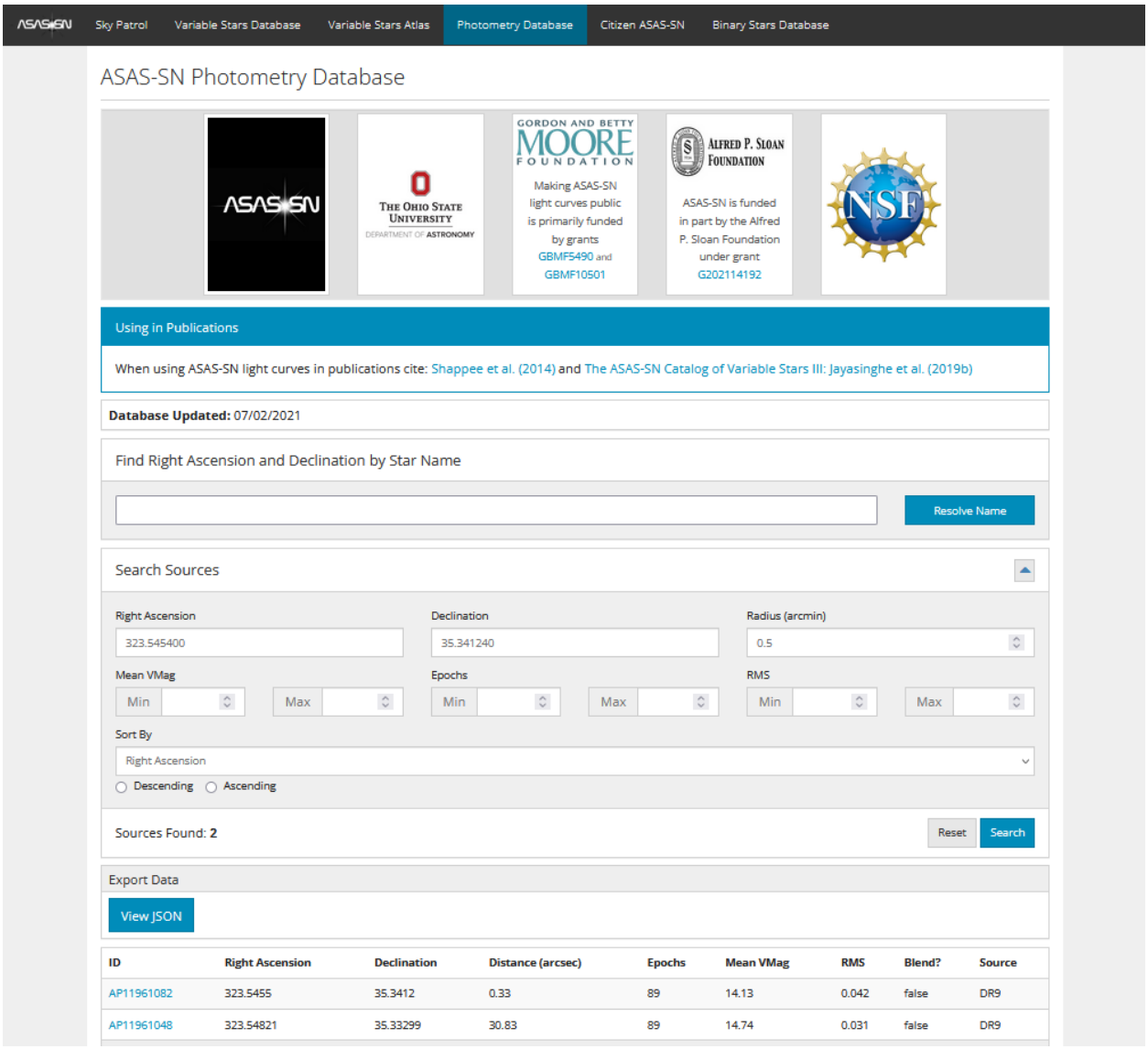
The new format contains the “Quality” column. ASAS-SN advises caution when using data that has not been flagged as “good” [https://arxiv.org/abs/2304.03791] (i.e., contains the “G“ flag in the “Quality” column:



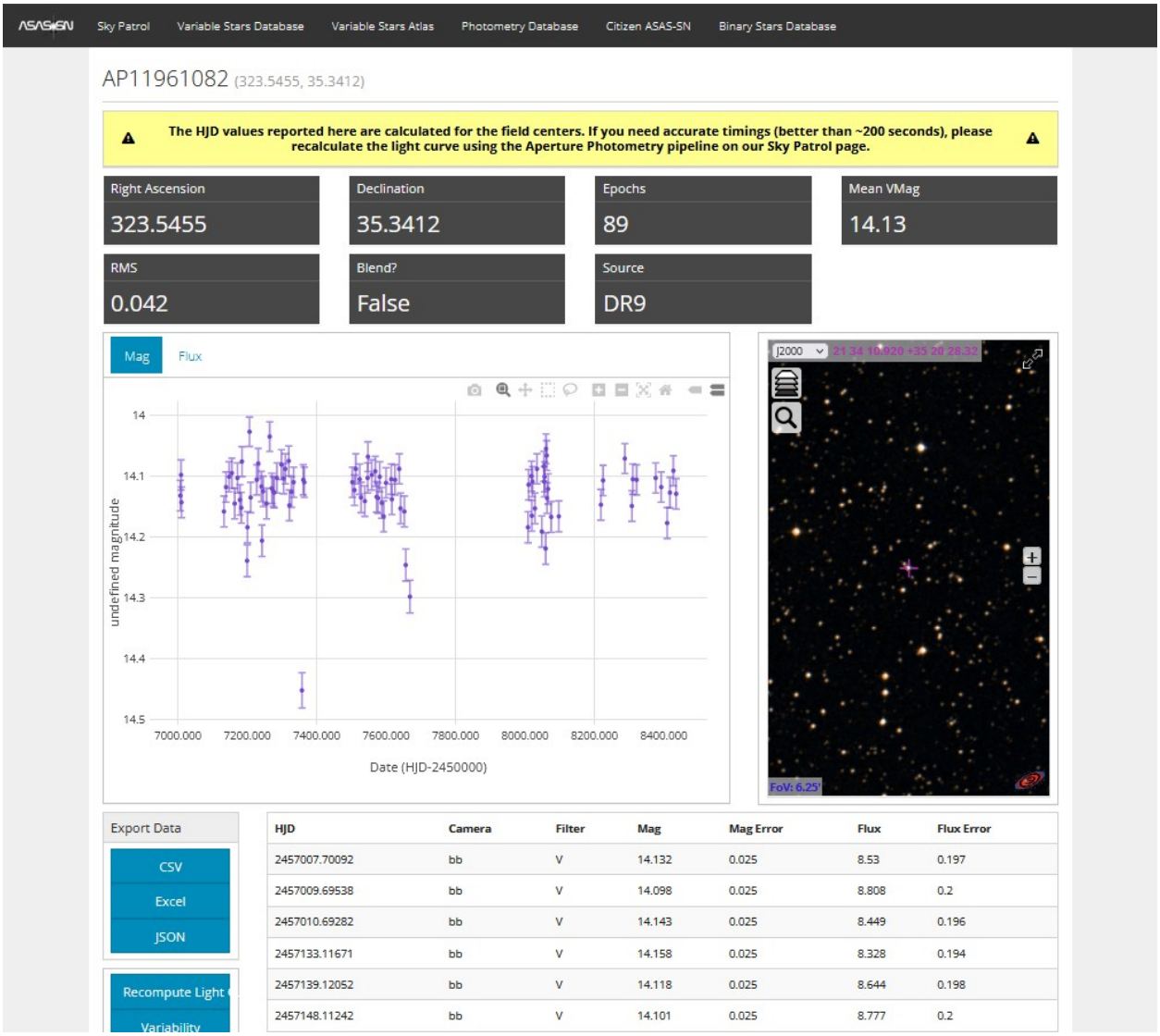
Time	Calendar Date	Magnitude	Uncertainty	Band	Record	Discrepant?	Name	FLUX	FLUX_ERR	FWHM	LIMIT	QUALITY	ASASSN_BAND
2457148.1143...	2015-05-05	14.1509	0.016	ASAS-SN V	9		146030292843...	8.3860	0.1237	1.70	16.9817	G	V
2457164.0441...	2015-05-21	14.1943	0.0058	ASAS-SN V	10		146030292843...	8.0576	0.0430	1.98	18.1287	G	V
2457275.7573...	2015-09-10	14.186	0.0077	ASAS-SN V	11		146030292843...	8.1188	0.0575	2.06	17.8137	G	V
2457372.724288	2015-12-16	14.1342	0.0078	ASAS-SN V	12		146030292843...	8.5158	0.0609	2.16	17.7513	G	V
2457568.9846...	2016-06-29	14.1415	0.0059	ASAS-SN V	13		146030292843...	8.4591	0.0458	1.72	18.0613	G	V
2457577.0784...	2016-07-07	14.1837	0.0062	ASAS-SN V	14		146030292843...	8.1364	0.0463	1.71	18.0474	G	V
2457626.9071...	2016-08-26	14.1445	0.0058	ASAS-SN V	15		146030292843...	8.4353	0.0453	1.66	18.0726	B	V
2457651.9476...	2016-09-20	14.0911	0.0339	ASAS-SN V	16		146030292843...	8.8604	0.2764	2.03	16.1084	B	V
2457721.7492...	2016-11-29	14.1412	0.006	ASAS-SN V	17		146030292843...	8.4614	0.0467	2.02	18.0393	G	V
2458045.8705...	2017-10-19	14.1618	0.0061	ASAS-SN V	18		146030292843...	8.3021	0.0470	2.01	18.0329	G	V
2458059.8266...	2017-11-02	14.2588	0.0208	ASAS-SN V	19		146030292843...	7.5923	0.1455	1.74	16.8056	G	V
2458079.7720...	2017-11-22	14.1569	0.0071	ASAS-SN V	20		146030292843...	8.3401	0.0547	2.00	17.8683	G	V
2458220.9751...	2018-04-12	14.3611	0.0113	ASAS-SN g	21		146030292843...	6.5400	0.0681	1.40	17.5694	B	g
2458221.968063	2018-04-13	14.4891	0.0121	ASAS-SN g	22		146030292843...	5.8126	0.0645	1.57	17.6293	G	g
2458244.9308...	2018-05-06	14.3319	0.0086	ASAS-SN g	23		146030292843...	6.7182	0.0530	1.66	17.8414	G	g
2458245.922495	2018-05-07	14.2299	0.0151	ASAS-SN g	24		146030292843...	7.3798	0.1025	1.48	17.1262	B	g
2458247.9186...	2018-05-09	14.2631	0.0083	ASAS-SN g	25		146030292843...	7.1580	0.0546	1.49	17.8096	G	g
2458248.9228...	2018-05-10	14.2832	0.0092	ASAS-SN g	26		146030292843...	7.0263	0.0597	1.46	17.7133	G	g
2458253.9025...	2018-05-15	14.2784	0.0061	ASAS-SN g	27		146030292843...	7.0576	0.0394	1.44	18.1647	G	g
2458256.8966...	2018-05-18	14.2899	0.0049	ASAS-SN g	28		146030292843...	6.9832	0.0317	1.56	18.3992	G	g
2458261.8846...	2018-05-23	14.2707	0.0047	ASAS-SN g	29		146030292843...	7.1078	0.0308	1.39	18.4327	G	g
2458262.8770...	2018-05-24	14.2601	0.0065	ASAS-SN g	30		146030292843...	7.1780	0.0426	1.44	18.0789	G	g
2458264.8646...	2018-05-26	14.2531	0.0123	ASAS-SN g	31		146030292843...	7.2241	0.0816	1.59	17.3730	G	g
2458266.9204...	2018-05-28	14.6741	0.0199	ASAS-SN g	32		146030292843...	4.9021	0.0897	1.42	17.2706	G	g
2458269.8926...	2018-05-31	14.2251	0.0101	ASAS-SN g	33		146030292843...	7.4130	0.0688	1.47	17.5586	G	g
2458270.893273	2018-06-01	14.2925	0.013	ASAS-SN g	34		146030292843...	6.9668	0.0835	1.48	17.3483	G	g
2458281.8152...	2018-06-12	14.2611	0.0057	ASAS-SN g	35		146030292843...	7.1710	0.0376	1.37	18.2132	G	g
2458290.9093...	2018-06-21	14.2696	0.0047	ASAS-SN g	36		146030292843...	7.1155	0.0310	1.46	18.4245	G	g
2458293.9351...	2018-06-24	14.2758	0.0044	ASAS-SN g	37		146030292843...	7.0746	0.0287	1.52	18.5061	G	g
2458302.900277	2018-07-03	14.2607	0.0076	ASAS-SN g	38		146030292843...	7.1738	0.0504	1.44	17.8975	G	g
2458304.806904	2018-07-05	14.2768	0.0068	ASAS-SN g	39		146030292843...	7.0680	0.0443	1.41	18.0368	G	g

Pre-computed ASAS-SN Light Curves

Other sources for ASAS-SN light curves are ASAS-SN Photometry Database [https://asas-sn.osu.edu/photometry] and ASAS-SN Variable Stars Database [https://asas-sn.osu.edu/variables]. Those databases contain ready-to-use light curves in a format that differs from one produced by Sky Patrol. The plugin loads files of both formats.
To download a light curve, go to one of the databases and enter the coordinates and the search radius (for both databases) or ASAS-SN variable name (for the Variable Star Database). If precomputed curves exist, they will be listed. Do *not* load the data via [Download CSV Dataset] button (the format is currently not supported by the plugin). Instead, click on one of the curves' IDs.



You will see a new window with a preview plot. Click on the [CSV] button under “Export Data” to download a file. This file can be opened by the plugin in the same way as described above.



HJD	Camera	Filter	Mag	Mag Error	Flux	Flux Error
2457007.70092	bb	V	14.132	0.025	8.53	0.197
2457009.69538	bb	V	14.098	0.025	8.808	0.2
2457010.69282	bb	V	14.143	0.025	8.449	0.196
2457133.11671	bb	V	14.158	0.025	8.328	0.194
2457139.12052	bb	V	14.118	0.025	8.644	0.198
2457148.11242	bb	V	14.101	0.025	8.777	0.2

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Rev D

2023-04-18

Revision History

Rev	Date	Description
D	2023-04-18	SkyPatrol V2.0
C	2023-04-02	Updated according to the last plugin’s revision
B	2020-04-26	Open Dialog image added
A	2020-04-17	Initial Release