AAVSO manual for submitting data on VSX

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INTRODUCTION

Overview

Data on variable stars are constantly changing. New and ongoing surveys are locating new variable stars every day. Corrections to errors in the data are always coming in. But all of this work to refine what we know about these stars is happening at different times and in different places. The mission of VSX is to bring all of that new information together in a single data repository, make it accessible to the public via a simple web interface, and provide the tools necessary for the controlled and secure revising of the data.

VSX was conceived and created by amateur astronomer Christopher Watson in response to the specific desires of the members of the Chart Team and the Comparison Star Database Working Group of the **American Association of Variable Star Observers** (AAVSO), and the broader perceived need for a globally-accessible central "clearing-house" for all up-to-the-minute established information on variable stars. The VSX website was designed to be the online medium by which variable star data are made available to the general public, and through which the data are maintained, revised, and commented upon. This database literally comes alive with the input from the world of registered contributors.

In order to keep VSX up to date and populated with the latest corrected findings, registered and approved individuals constantly review and revise the metadata, always citing sources for any new details, and fully documenting the rationales behind any additions or changes. By maintaining a strict version control on all records, the history of the gathered knowledge on each variable star can be traced, validated, and followed up on by those who rely on this information to be accurate and true.

Specifics

The VSX database was initially populated with the entire Combined General Catalog of Variable Stars (GCVS 4.2, 2004 Ed.). This included the main lists from Vol. I-III, the NSV catalog of suspected variable stars and its supplements, all cross-identifications from Vol. IV, and all references and remarks from all volumes. Differences between the published 2004 Edition of the GCVS and the "living" version available from the Sternberg file servers were then

culled and integrated. On top of this base data set were added the published catalogs of red variables from the Northern Sky Variability Survey (NSVS), the detected variables from the 3rd All Sky Automated Survey (ASAS-3), all new variables reported in the various volumes of the Information Bulletin on Variable Stars (IBVS), the Miras and eclipsing binaries found and published from Phase 2 data of the Optical Gravitational Lensing Experiment (OGLE-II), and the bright contact binaries extracted from data of the Robotic Optical Transient Search Experiment (ROTSE-I). All together, this became the Base 1.0 Version of the VSX object table. Internal relations between the object, reference, remark, and cross-identification tables were established programmatically using the various source data. New, unpublished cross-identifications between the various catalogs were generated through custom cone search algorithms, and then verified.

Moderating the Database

Moderators use a secure log-in to access online tools for working with the database. All modifications or additions submitted are queued in a staging bin, and peer reviewed. When the submission is been accepted, it is published to the live database, and all particulars about the change/addition are logged with the revision. The modification of stellar record on VSX is assigned a revision number, which can be referenced at any time to retrieve any version of the data for any particular star. Submissions that are not accepted because modifications were required, or incomplete submissions, are automatically deleted by the system after two months. Published revisions determined at a later time to be erroneous for any reason, can be rolled back. The Data Moderators and/or Project Administrator at all times reserve the right to reject a submission for modification or a new variable star submission, and may, at their discretion, revise any submission made to VSX for clarity, consistency, or convention.

Querying the Database

Web-based tools for querying VSX in various ways are available to the public. The public data returned in a query transaction contains all the accumulated data for the most recent revision level for each star in the recordset, including details of all modifications made to the data, and references to support those changes. Previous revisions may also be viewed. The public interface does not include the means for modifying the data in any way (only registered users may do this).

Suggestions for modification may be sent to the administrators.

Submitting Variables to VSX

We encourage individual submission of new variables to the Variable Star Index (VSX). These can be single stars that you have discovered through your own observations or through data-mining; batches of stars, such as from a publication that is not already included in VSX; or changes/modifications on existing VSX stars.

As opposed to comet or asteroid discovery, you will get little or no credit for discovering a new variable star. It is pure science and the willingness to contribute to the community. A new variable will typically have some assigned name (from an existing catalog like GSC, 2MASS, etc.), and sometime later, it may also have an assigned GCVS name (this can take years). You may provide a discoverer's abbreviation and sequence number, but there is no guarantee this name will stick or will be used by the community. There are rare occasions when an unusual object garners attention, and an informal discoverer's name gets attached: McNeil's Object, Sakurai's Object, Barnard's Star, etc. Don't count on it, though!

Adding stars to VSX helps the community. When studying a particular star, observers typically use one or more neighboring stars as comparison stars. By letting the community know about every variable, observers can search VSX when selecting their comparison stars and know that they are not selecting a known variable. Adding variables to VSX also broadens the database of variables, giving more selection to researchers who are interested in a particular class, period, location for their studies. You may think that adding only one star is not important, but it is like voting - thousands of people adding one star a piece end up building a valuable database, and your particular star might be that really unusual one that everyone wants to study.

So, let's get into the details. While the discussion below is geared towards someone submitting original observations leading to the discovery of a variable, you can also do data-mining of existing databases like ASAS-SN, ASAS-3 and NSVS etc. Just beware that there is a double standard: we are more critical of data-mined submissions because we expect the submitter to do some work, such as period analysis, rather than just regurgitating information already available from a given survey site. Also, don't be too critical of objects already contained within VSX: we have accepted complete lists of previously published objects rather than applying criteria to each and every object on those lists. New submissions are subject to more strict quality control.

DATA SUBMISSION

I. Submission Policy

Keep the following in mind before submitting a new object or revision:
·   Read the whole guidelines before attempting your first VSX submission.
·   At least a basic knowledge on variable star light curves and analysis is required. Moderators will help you through the submission process but cannot teach you how to analyze a variable star.
·   Observers undertaking systematic searches of variable stars resulting in a large number of discoveries are encouraged to submit their results to journals like the JAAVSO.
·   Check the literature (VizieR/SIMBAD) to confirm your variable star is a new object. We try to keep VSX up to date but there are lots of recent lists/papers that are still not included in VSX and you cannot be credited as the discoverer if the object has already been published (you are welcomed to submit it with the proper reference anyway).

·   Make sure the object is identified correctly. Give the J2000 position based on Gaia DR2 as given by VizieR or from another astrometric catalog such as UCAC4 if the object is not present in Gaia DR2.

·   If you find a new variable, you should be able to combine your new data with archival survey data like those from ASAS-SN (all-sky ASAS-SN observations have become available between Vmag. 10 and 16.5). CRTS, ASAS-3, NSVS, SuperWASP or other available and relevant datasets depending on the star's position and magnitude should be checked and used if they are useful to get much better elements and secure the object's classification.

·   VSX is primarily a catalog of Galactic variable stars. Variable stars in globular clusters and extragalactic objects like supernovae and quasars are normally not included, unless for historical reasons or for AAVSO observing campaigns.

·   The number of submissions per user/group is restricted to one per day.

·   If you are performing a systematic search of variables resulting in lots of new objects, we encourage you to publish those results in a journal (e.g. JAAVSO or PZP) instead of submitting them individually to VSX.

·   Submissions that have still not been accepted after two months (60 days) when modifications were required, will be deleted by the system.

II. Is your object Variable?

        To make it into VSX, the object must be proven variable. What constitutes proof, though? Here are some basic guidelines. We will bend the rules in unusual circumstances, but in general, if you follow these guidelines you have a very good chance of having your favorite object added to the system.

        a. Variability is determined with all information possible. If you submit only a few data points (10-30), you need to justify your conclusion that this object is variable with supporting additional evidence and notes: is this variability substantial (within measurement errors)? Can you use data from the 2MASS catalogue to see if this star has a red color, whether it is a Mira variable? etc. We strongly encourage that you observe your object often (many times during more than one night) and submit the full light curve of your observations. Incomplete or sparse light curves can not be accepted as evidence of variability, as they do not provide much information   on   the   star.
        This is an example of a light curve without enough points (this light curve will not be acceptable by itself):

Sparse coverage, not acceptable
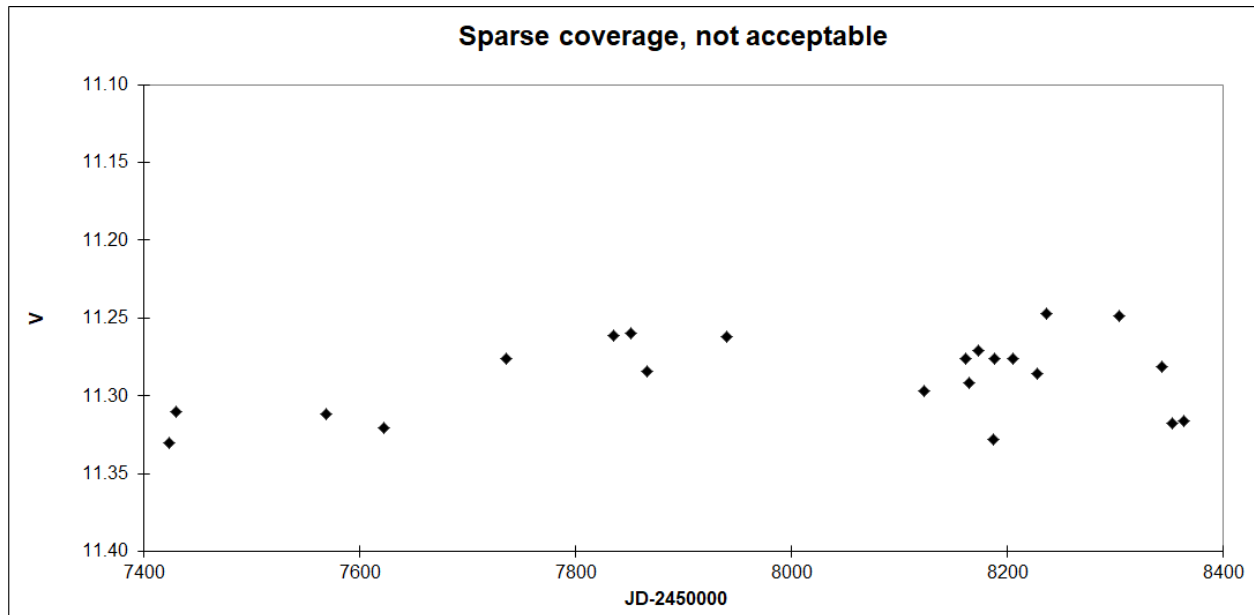
This is the same star but with enough observations to confirm variability and even classify it as a GCAS-type object:
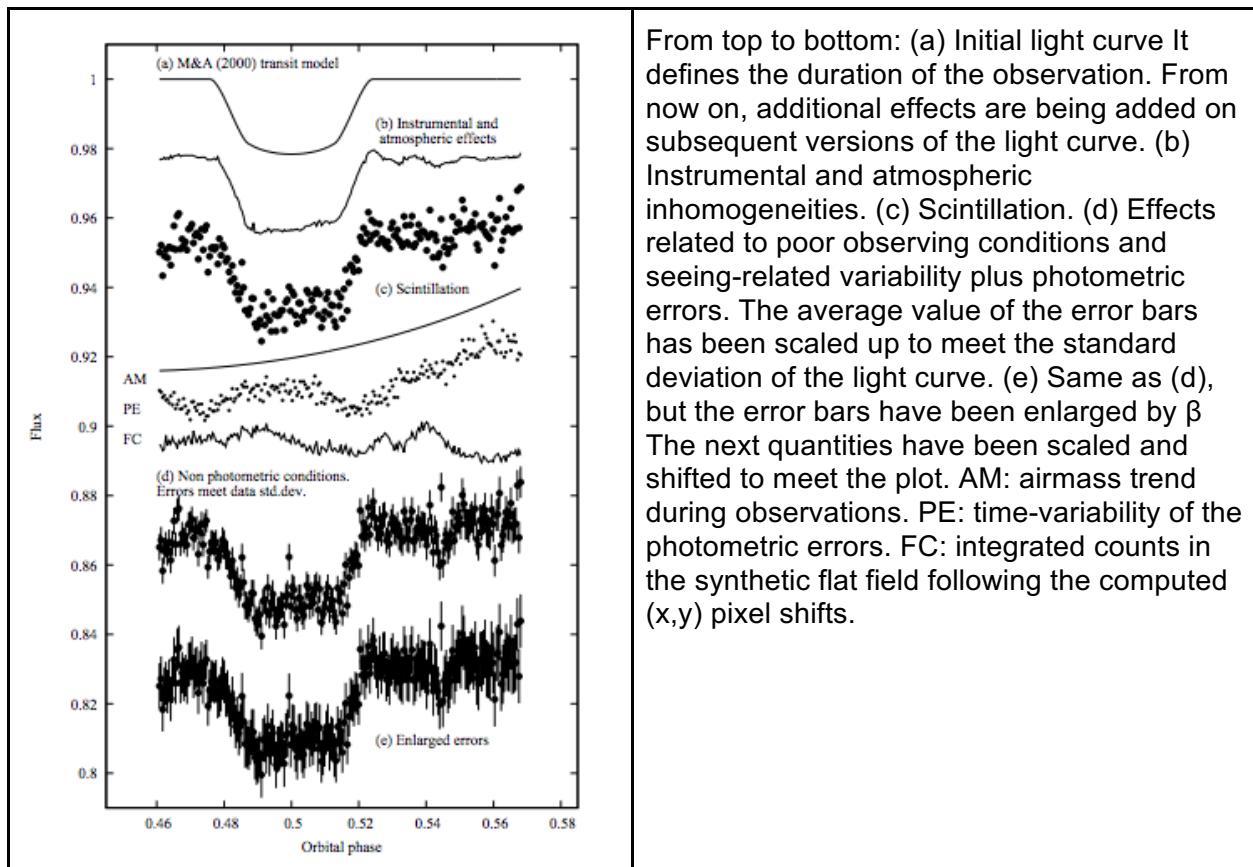

A GCAS star, dense coverage
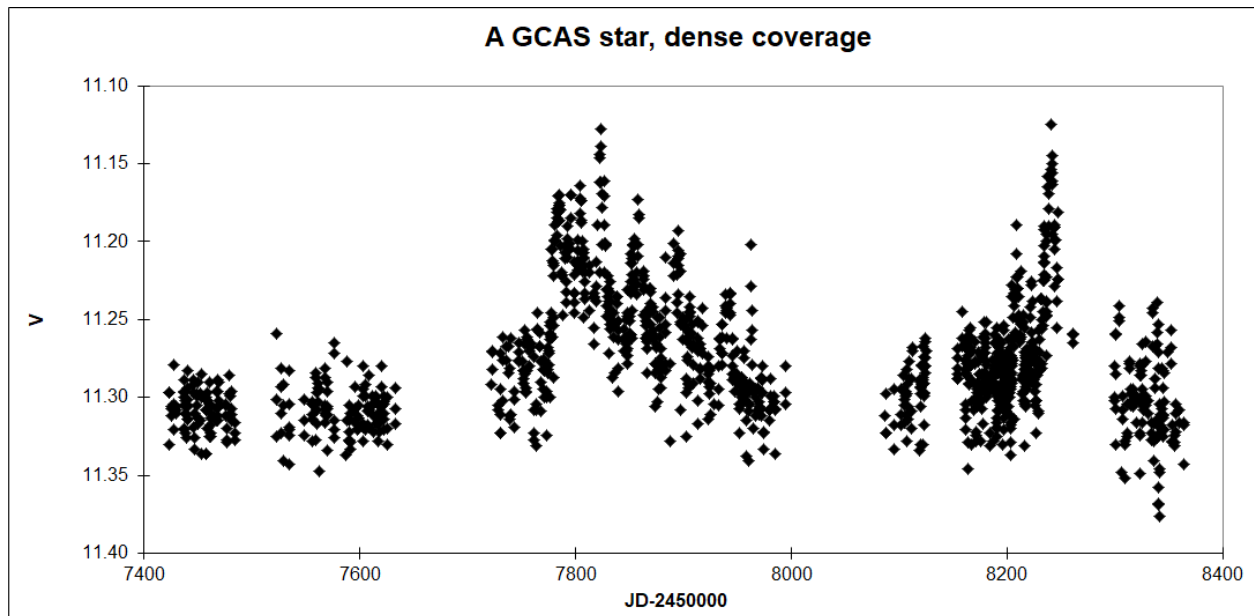
Submission of discoveries from visual observations is discouraged, except for transient objects like novae. If you are suspicious that an object is a visual variable, please post to one of the AAVSO forums (e.g. the AAVSO Visual Observing Forum) and ask our AAVSO community for confirmation.

      b. Unfiltered observations are discouraged. There are many systematic problems with unfiltered observations. If you must submit unfiltered CCD photometry, please check a plot of air

mass for the object and assess whether your variation mimics or mirrors the air mass change (a common problem). You should also check the color of the object and of the comparison stars, if possible (Tycho B-V, 2MASS colors, something that helps you understand the color differences). We may request more supporting evidence for unfiltered submissions. Observing with at least two filters is highly useful for discovery work—you can often roughly classify a star if you have its color and light curve shape.

The following image demonstrates the impact of common atmospheric effects on a light curve (image taken from C. von Essen et al. A&A 2018 -- https://arxiv.org/pdf/1607.03680.pdf)

From top to bottom: (a) Initial light curve It defines the duration of the observation. From now on, additional effects are being added on subsequent versions of the light curve. (b) Instrumental and atmospheric inhomogeneities. (c) Scintillation. (d) Effects related to poor observing conditions and seeing-related variability plus photometric errors. The average value of the error bars has been scaled up to meet the standard deviation of the light curve. (e) Same as (d), but the error bars have been enlarged by β The next quantities have been scaled and shifted to meet the plot. AM: airmass trend during observations. PE: time-variability of the photometric errors. FC: integrated counts in the synthetic flat field following the computed (x,y) pixel shifts.

c. For transient objects, such as novae, we strongly recommend that you first submit your discovery to the IAU Central Bureau for Astronomical Telegrams (http://www.cbat.eps.harvard.edu/CBAT. See also http://www.cbat.eps.harvard.edu/HowToReportDiscovery.html). That disseminates the information the fastest, and also is the avenue for obtaining confirming observations of your object (CBAT usually contacts the AAVSO for follow up observations). You can also announce your discovery on many of the alert mail lists, such as vsnet-alert baavss-alert.

III. What information do I need to have before submitting a discovery?

a. First, you need accurate coordinates of your new object. Gaia DR2 should be able to provide the requested accuracy of no worse than an arcsec or two of error.

b. Minor planets (e.g. asteroids) are the vermin of the sky. They get into many images, and when near stationary points, can be very slow moving. Check to see if one of these might be your "new" star at the SN Candidate Minor Planet Checker. We also highly recommend that your observations be made over several days so that you can look for even small motion. Supernovae candidates should be reported to the Transient Name Server (TNS, https://wis-tns.weizmann.ac.il/content/tns-getting-started). We do not accept supernovae unless they become campaign subjects or people specifically request their inclusion because they have observations of them.

c. Check to see if this is already a known variable. The best place to start is VSX itself. You should do an area search, as an exact coordinate match is unlikely, and some reported variables had large error in their discovery report. Other sources to search include SIMBAD (http://simbad.u-strasbg.fr/simbad/) and VizieR (https://vizier.u-strasbg.fr/viz-bin/VizieR). VizieR will also give you cross-identifications and photometry from existing catalogs, which is useful information to include in your report. When you "search by position" in VSX you will get links to search by position in a number of other catalogs without having to enter the position again.
(*Note: be sure to have the relevant boxes checked: Variables (V), Suspects (S), Non-variables (N) and Not checked should be marked if not your search won't return any results but there may be a known object at that position*).

d. If you are observing unfiltered, don't compare your results against any of the photographic surveys (DSS, POSS, etc.) to demonstrate "variability". Many red objects will appear brighter on your images than on the archival plates; this can often be many magnitudes of difference.

e. Look carefully at your images. There are many defects that can lead to false variability. Air Mass effects were already mentioned, but there are ghost images of bright stars, scattered light, hot/cold pixels that migrate through images during time series, etc. Think of any way that a problem could affect your data and guard against it before assuming variability. If you are uncertain, ask the experts on one of the maillists that have been mentioned, or on the AAVSO VSX Forum, etc.

IV. Submitting your results to VSX

a. You need accurate coordinates. Anything with more than one arcsec of error is discouraged. It is easy to get sub-arcsec precision with the modern astrometric reference catalogs now available. If the object appears in some common catalog, you will be asked for that cross-id. Coordinates should come from an astrometric catalog. Use J2000.0 positions from Gaia DR2 as computed by VizieR whenever available (http://sci.esa.int/gaia/60243-data-release-2/). Some common examples of cross-identifications:
GSC 01234-06789 (5 digits before and after the dash, use leading zeroes if necessary)

2MASS J11431012-5804040 (use a J before the coordinates)
USNO-A2.0 0300-13671194
USNO-B1.0 0319-0360318 (use a dash between USNO and the catalog version, it is part of the acronym)
GSC2.3 S111210165373
UCAC4 810-003941

b. You need to provide the maximum and minimum magnitude of variability. If you have calibrated reference stars in your image, use those to determine the zeropoint and the target magnitude. Use AAVSO sequences, APASS, ASAS-3 (V-filtered) or VizieR catalogs like CMC15, Pan-STARRS1, Gaia DR2, IPHAS, SDSS, VPHASDR2 or UCAC3 (http://vizier.u-strasbg.fr/viz-bin/VizieR), through transformations to get calibrated maximum and minimum magnitudes in a standard passband (preferably in V). You can also use USNO-A2.0, USNO-B1.0, GSC2.3, etc. if the star is too faint and not present in the other surveys, but you should indicate the type of magnitude and its source. If it is impossible to provide an accurate calibrated minimum and maximum magnitude in the same passband you may provide a magnitude (e.g. in V) derived from one of the catalogs mentioned above (which may be considered to be the mean magnitude for stars with a relatively small amplitude) and the observed amplitude in another passband (e.g. clear, without filter). A spreadsheet to apply these transformations is available at
https://www.aavso.org/vsx/_images/UCAC3_CMC15_SDSS_convertions.xlsx
An example of calculating transformed V from CMC15 and UCAC3 is shown in Appendix 3. For outbursting stars like novae or dwarf novae however, the maximum magnitude should always be given.

Note: throughout when maximum magnitude is used, it is meant to be the magnitude at maximum, when the star is at its brightest and thus with the smallest number for the magnitude (e.g. a dwarf nova in outburst) as it is customary in variable star studies. The minimum magnitude is then the magnitude at minimum, when the star is at its faintest and the number for the magnitude is largest (e.g. an eclipsing binary at mid eclipse).

c. Submit supporting evidence. We request at least a plot of the photometry with time on the horizontal axis and magnitude on the vertical axis (brightest at the top, faintest at the bottom). If you have sufficient information to analyze the light curve, determining period and classifying the star, then you should also submit a phase plot. You can also include the actual data in a tabular form as it may clarify suspicious light curves or help in a better determination of type and/or period later on. Submitting the data in tabular form only is not allowed. Please do not submit the actual data under the assumption that this Web site will archive that data, as VSX is not the AAVSO International Database. We do not guarantee that any submitted data will be retained.

If you want to submit your data to the AID, please keep in mind that a variable star should have an AAVSO Unique Identifier (AUID) before observations of that star can be submitted to the AAVSO International Database. Use the Request AUID link in the AAVSO UID field if you need to submit data for a star without an AUID. VSX moderators get a notification

and assign the AUID immediately. This is the fastest way to get an AUID assigned, and moderators will be able to check for duplicate entries on VSX or other existing information. E-mails to HQ will be directed to VSX moderators so they will take more time. If we do not encourage observations of that object (e.g. constant stars, stars with extremely low amplitudes), you will be contacted.

You have to be logged in to VSX for that option to be active. If you don't already have a VSX account, please create one through this link:

https://www.aavso.org/vsx/index.php?view=registration.top.

The New Star Form gives you the choice to upload two supporting documents. If you have more than two plots to upload (e.g. finding chart, phase plot of one period and phase plot of another period), you can save a draft of your submission and then you will be able to edit your draft and upload as many files as you want (saving a draft version each time you upload a file).

d. Most 14th magnitude stars are easily identifiable on the Digital Sky Survey images https://www.sdss.org/ with good coordinates. However, for crowded fields, or very faint stars, or stars that do not appear in one of the major catalogs like Gaia or 2MASS, you should submit a finding chart. The rule of thumb is that if there is any chance for confusion, identify. You want people to be able to find this new variable! These finding charts should be in jpeg, png or gif format and reasonably small (please don't submit bitmaps or fits files); north and east marked, and some indication of scale.

V. New variables and submissions from data mining

In general, the data submitted to VSX for new variables found in (public) survey data should be as complete as possible: the position, variability type, and maximum and minimum magnitude should always be given. For periodic variables also the period and epoch (time of minimum for eclipsing binaries, RV Tauri pulsators, ellipsoidal and rotational variables, and of maximum for pulsating variables) are required.

a. Always give the identification of the object from the survey, e.g. NSVS 123456 or ASAS   J123456-7840.1   when   available.

b. The positions given by surveys like NSVS and ASAS-3 are not very precise and may have errors of 10" and more. If it is possible to unambiguously link the object to one from an astrometric catalog, give the identification from that catalog (please do not use Gaia DR2 names unless there is no other identifier available) and use its position. Depending on their brightness, stars closer than 60" from each other may be blended and measure as one object in some of the surveys, try to choose the most probable identification based on colors or magnitudes.

c. Do not attach the light curves provided by survey web sites, and please do not attach the data file from surveys. These are easily available from within VSX. Instead provide phase plots (for periodic variables) or combine light curves from several surveys into a single plot,

making sure data from different surveys are distinguishable. When two or more synonyms are present in the NSVS database, combine these on a single plot as well, preferably also with different symbols and/or colors. Data from other surveys for which there is no link-out from VSX should be attached or an url should be provided.

d. Some general remarks on the use of data from particular surveys:
To use ASAS-SN data, edit the "Enter the number of days to go back" field to get all the available data (starting from 2455500 or so).
The date given by NSVS is MJD-50000 = JD-2450000.5. VSX expects HJD for the epoch, so add 2450000.5 to the NSVS date (and make the heliocentric correction)
Use mask 6420 for NSVS data.
In general, do not use ASAS-3 data of category D.
Beware of low quality nights and different zero points in SuperWASP data.
Submissions based only on Tycho photometric data are not acceptable.

e. Some notes about the resolution of stars by particular surveys. Stars closer than the following distance will be blended:
All Sky Automated Survey for Super Novae (ASAS-SN): ~17"
    https://asas-sn.osu.edu/
Northern Sky Variability Survey (NSVS): ~55"
    https://skydot.lanl.gov/nsvs/nsvs.php
Super Wide Angle Search for Planets (SuperWASP): ~60"
    https://wasp.cerit-sc.cz/
All Sky Automated Survey-3 (ASAS-3): ~23" (up to 40" in the case of bright stars, e.g. mag. 8-9)
    http://www.astrouw.edu.pl/asas/
AAVSO Photometric All-Sky Survey (APASS): ~12"
    https://www.aavso.org/apass
Catalina Real-Time Transient Survey *Catalina Sky Survey* Telescope (CSS): ~11"
Catalina Real-Time Transient Survey *Siding Springs Survey* Telescope (SSS): ~9"
Catalina Real-Time Transient Survey *Mt. Lemmon Survey* Telescope (MLS): ~7"
    http://crts.caltech.edu/

A spreadsheet to correct magnitudes for light contamination from companions (deblending) is available at:
    https://www.aavso.org/vsx/_images/COMBLEND.xlsx
A remark should be added to indicate if a correction was applied (recommended) or not and to provide information about the identification, magnitude and distance of the companions.
E.g.: "ASAS-3 magnitudes contaminated by GSC 00000-00000 (V= 14.5; sep. 17"). Range has been corrected."

VI. New variable star submissions from the literature

a. A number of variable star catalogs has been imported into VSX. However a large number of variables have been described in the literature, which have not been assigned a

GCVS name and have not been incorporated into VSX. For other variables up-to-date information exists in the literature (e.g. corrections of GCVS or survey data) but it has not yet been entered into VSX. Your help to make VSX more complete and up-to-date is also welcome.

b. Provide all data found in the paper. Use the position as given the paper, or provide a better position (from an astrometric catalog) based on the id given in the paper. Information which cannot readily be placed into the standard VSX fields, should be added as a comment. E.g.: magnitude at secondary minimum for an eclipsing binary, epoch of secondary minimum for an eccentric eclipser, etc.

c. Provide the bibcode of the publication and the link to the ADS abstract page (http://adsabs.harvard.edu/abs/...) when it exists. For preprints published on astro-ph, give the url of the ADS abstract page as well (e.g. http://adsabs.harvard.edu/abs/2014arXiv1401.0635T). When a bibcode does not exist, give the url of the online publication whenever possible. When a publication cannot be accessed online, provide a scanned copy, so that the moderators can verify your submission. Notes in email discussion groups such as vsnet-alert, cvnet-discussion, etc. are acceptable as references when they provide enough information to decide that the object is a variable (in principle the same rules as in sections I and II are valid here).

If you have more than one reference to give (e.g. data from multiples sources), you can save a draft of your submission in the New Star Form and then you will be able to edit your draft and add them (saving a draft version after each reference you added).

d. If there are more than 10 or so new objects or revisions available electronically in tabular form from a single publication, send a message to vsx@aavso.org. Often these can be more easily imported into VSX, rather than be entered manually. Preparing a list (a text file or an Excel spreadsheet) with the relevant data separated in columns will save you (and VSX moderators) a lot of time.

VII. The VSX process

Make sure to double-check everything before pressing the submit button. There is a "Draft only" checkbox at the bottom of the New Star form that will let you work with your submission until you are sure you are ready to submit it. Use it.

Be sure to use the Spot check link in the Position field and the "Check name" link in the Primary name field to avoid duplicates.

Once you have submitted a new star for inclusion in VSX, the request is sent to a group of volunteer "moderators." These folk are experts in variable stars, usually having looked at thousands of light curves and often long-time observers themselves. One or more of the moderators will look at your submission. If you have been diligent and have submitted an obvious candidate, it will often be approved within a very short time (up to a few days), depending on the workload.

There will be submissions where the moderator thinks insufficient or incorrect information has been submitted. He or she will then usually contact the submitter, asking for clarification. Please do not consider this as confrontation or lack of respect; moderators are truly trying to help. They may offer suggestions as to how to re-submit your data to ensure data check is easier in the future. Submissions that have not been accepted after two months (60 days) when modifications were required, will be deleted by the system.

Also, do not be discouraged if your submission is rejected. The moderators will give you their reasoning for the rejection. Read it carefully! You will get rejection often in life, and astronomy is no different. Most professionals submit dozens of proposals during their career with the majority being rejected by their peers. Learn from the comments and try again!

At any time, the moderators may invoke their right to revise or otherwise update any submission made to VSX for clarity, consistency, or convention, whenever they believe the modification can be made without adversely affecting the integrity of the submission. Typically, you will be informed of any changes made by the moderators.

Note that these comments are geared towards submission to VSX. VSX submission does not preclude sending your data analysis to some other additional source, perhaps as a formal paper for publication. We do not retain any kind of right to your data. There are many journals that accept variable star research, and we recommend that you look at them all carefully. The ones we have found most useful are:

JAAVSO (http://www.aavso.org/publications/jaavso/)
Run by the AAVSO; fully refereed and both electronic and hardcopy. There is a page charge for non-members. Access to this website is restricted to AAVSO members only.

OEJV (http://var.astro.cz/oejv/)
A good basic journal. Electronic only. Now refereed.

Peremennye Zvezdy (http://www.astronet.ru/db/varstars/)
Run by the GCVS folks. Electronic only. Refereed. The supplement contains primarily observational results and matches most discovery projects.

IBVS (http://www.konkoly.hu/IBVS/IBVS.html)
Run by the IAU Commission 27 and 42, this is a fully refereed journal. Electronic and hardcopy. Harder to get papers published here; usually require full analysis.

JBAA (http://www.britastro.org/jbaa/)
Primarily for members of the BAA. Nice journal published 6 times per year. No electronic version.

PASP (http://www.journals.uchicago.edu/PASP/)

This fully refereed, professional journal will accept quality articles from amateurs. Page charges.

Many other professional journals accept variable-star articles, but the ones listed above are the most common. Good luck!

Appendix 1:

Variable star types and VSX designations (if you are interested to learn more about variable star light curves, please consider attending the AAVSO CHOICE course "Variable Star Classification and Light Curves").

Based on the General Catalog of Variable Stars (GCVS) document of variable star type designations (Samus et al., 2009) with expansions, clarifications, corrections, and additions from the literature and surveys.

This list includes all variability types found in the AAVSO International Variable Star Index (VSX). Most of them come from the GCVS, but we have added new types recognized in the literature and types used in lists published in other studies and surveys.

Some conventions included in this list:

A colon (:) after the variability type -or any other field- means the value/classification is uncertain.

A pipe character (|) between two different types signifies a logical OR; the classification is uncertain and all possible types are indicated. An example of this is ELL|DSCT, where the star may be an ellipsoidal binary system or a DSCT-type pulsating variable with half the given period.

A plus character (+) signifies a logical AND; two different variability types are seen in the same star or system. An example of this would be ELL+DSCT, where one of the components of an ellipsoidal binary system is a DSCT-type pulsating variable.

A slash character (/) indicates a subtype. In the case of binary systems (eclipsing, ellipsoidal or reflection variables) it is used to help describe either the physical properties of the system (E/PN or EA/RS), the luminosity class of the components (EA/DM), or the degree of filling of their inner Roche lobes (EA/SD). This is the GCVS classification system. In cataclysmic variables, slash characters are used to indicate some properties of the system, as in the degree of polarization (NA/DQ) or the nature of their components (UG/IBWD). In some cases, these subtypes also constitute an independent main variable star type, because the main type of variability they are usually associated with is not present. There are non-eclipsing RS CVn stars (RS), eruptive single Wolf-Rayet stars (WR) and cataclysmic binary subtypes showing variability but no outbursts (DQ, IBWD). In X-ray binaries, the subtypes indicate which kind of behavior the binary displays, as in X-ray bursts (XB), large amplitude outbursts also in the visual (XN),

reflection effect (XR) or it may also indicate something about the object's nature, as in a compact object which is a pulsar (XP). Finally, the subtypes of NL (nova-like; NL/V and NL/VY) are shown as independent classes, since these subtypes do not apply to a class other than NL.

Some variability classes show more than one type of variation, but they have been classified in the group that includes their more important type of variability. For example, SDOR stars show both eruptions and pulsations, but they have been included in the eruptive group only. The type definition explains their behavior. RCB stars also pulsate, but since their main feature is deep fadings, they are also included in the eruptive group only. The same is valid for the DY Per stars. DPV variables show periodic orbital variability, but they experience mass loss and what defines them is the presence of a long period lasting about 33 times the orbital period. They are therefore also included in the eruptive group only. The origin of variability of the λ Eri type variables (LERI) is not clear: they may be due to rotation or non-radial pulsation. They have been included in the class of rotating variables only.

Survey types are classifications taken as they appear in the original published lists from the survey owners/analysts. They are included under separate heading in this document because they are not actual types, per se, but are usually the result of less specific classification due to the automated nature of the analysis. These types should eventually be replaced by the conventional types.

Variable type designation used in VSX but not currently used in the GCVS are highlighted in the main listings of this document by the accompanying icon.

The full list of VSX variability types can be found at https://www.aavso.org/vsx/index.php?view=about.vartypes.

Appendix 2: Examples of VSX Submission

There are two different ways one can submit new star discoveries on VSX: through our "New Star Wizard" and our "New Star Form". The following examples are step-by-step instructions how to submit data using either of the methods. Both ways accommodate "novice" and "advanced" data submissions.
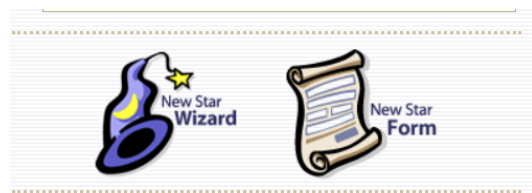
1. **New Star Wizard Example – Novice discovery**

Even when we recommend submissions based on full-analysis (e.g.: survey data combined with the observer's data), we have a Novice discovery option that should be checked in the case of discoveries based only on own observations.

Overview:

For this example, it will be assumed that a new star has been discovered by an individual either with their own telescope or a robotic telescope network such as AAVSOnet. This individual has taken numerous images, primarily with a clear filter (we will call it "visual") but also including some Johnson V-band observations. This individual has a very extensive light curve based on observations from HJD 2455800 through HJD 2456500 (August 26, 2011-July 26, 2013) and is ready to make a submission to VSX. *It should be noted that this is an example for educational purposes only and that this star does not actually exist and is therefore not in the VSX database.*

The stars presented in Sections 2 and 3 below are actual stars submitted to VSX as the result of data mining and paper submission/review.
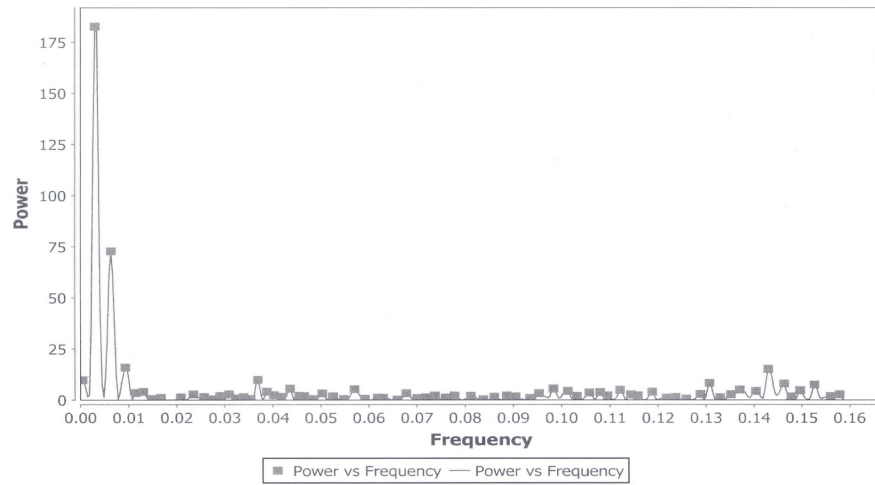
Based upon the light curve obtained over the time mentioned above, the observer has the following supporting data to make the claim of a new star discovery. This data was analyzed with the AAVSO VStar (https://www.aavso.org/vstar) software, but other analysis tools could have also been used. First is the composite light curve obtained over the observing period.

Light Curve for HD 82902
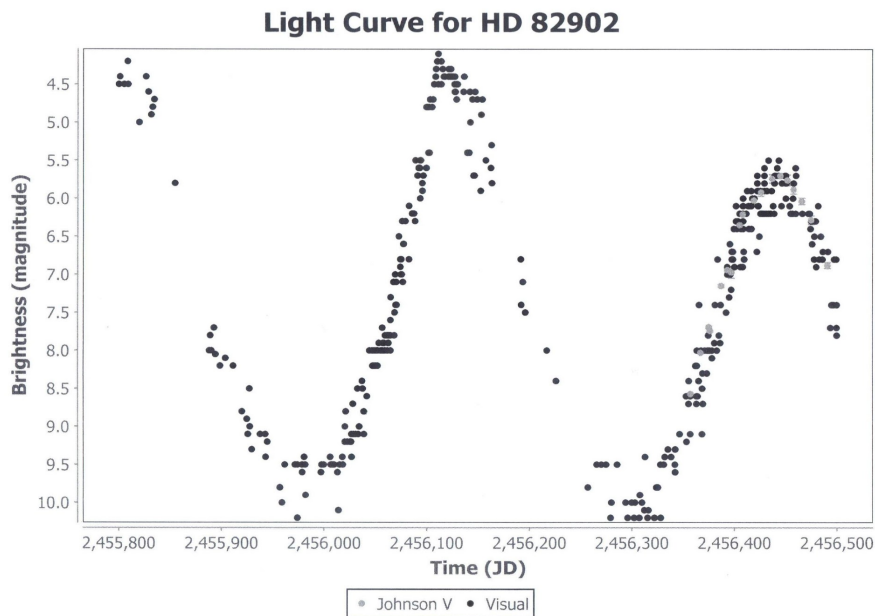
Based upon this light curve, an analysis was performed using VStar to determine the period of this object. The period was analyzed with the DC DFT option in VStar, thereby producing the power spectrum periodogram shown. If the "Top Hits" tab is selected in the DC DFT results panel, a table of frequencies is presented. Select the Top Hit with the highest power/amplitude. This yields a phase plot for this star as shown below.
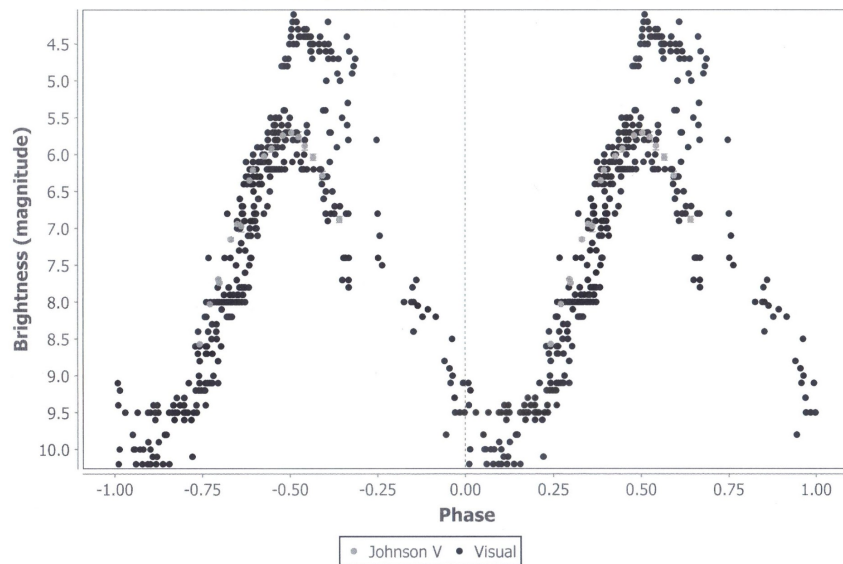

Period Analysis (DC DFT) for HD 82902
(series: Visual)

Phase Plot for HD 82902
Oct 2, 2018 (database), period: 335.724288, epoch: 2454597

To begin the submission process for VSX, log into the VSX page either through the "Log In" or "Submit" link. Supply your User Name and Password. The first page is shown below.

Clicking on the "Start" button yields the "Novice discovery" page as shown. If this is a novice discovery, put a check in that box on the page. If it is not a novice discovery, click on the "Next" button. This will yield the "Position' page.

AAVSO Home

The International
Variable Star Index

Search   Submit   Register   Log In   Account   About

Current Time: 03 Sep 2018 15:56:45 UTC   David H. Hinzel, you are logged in.

» My Submissions   » Preferences   » Log out

New Star Wizard

Position   [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [R]

What is the position of this new variable object?

Provide in the field below the equinox J2000.0 equatorial coordinates for the new variable star you are submitting. This position may be expressed sexagesimally (HH MM SS.ss ±DD MM SS.s) or in decimal degrees (DD.dddd ±DD.dddd). Don't round the figures off. Accuracy and high precision are important, as the position is used to aid in correlation of the submitted object to those in other catalogues. It is preferrable to use the coordinates found in a major astrometric catalogue. When selecting a catalogue for position, start with UCAC3, then 2MASS, then USNO-B1.0.

ALWAYS CHECK FOR DUPLICATES! Never fail to click Spot Check after entering the position for the object. There is always the possibility that the variable object you are about to submit is already in the VSX database.

IMPORTANT NOTE REGARDING CROWDED FIELDS! Submission of new variable stars in crowded fields may require an accompanying CCD finding chart with sufficient scale to unambiguously identify the variable.

ⓘ **J2000.0 Coordinates** | 09:32:45.19 -62:45:21.6 |

Examples: 21 42 42.84 +43 35 10.2
07:04:04.22 -03:50:51.7
34.83722 -2.97818

» Spot Check

[Cancel]   [Back] [Next]

Enter the position of the star in R.A. and Dec. Gaia DR2 (J2000.0) positions are recommended as mentioned previously in this manual (http://sci.esa.int/gaia/60243-data-release-2/). Select "Spot Check to see if there is another star in this position. If not, the window will look like this, (i.e., nothing within 120 arcseconds):

Are any of the below listed objects equal to the variable star you are about to submit?

Below is a listing of objects in the VSX database that are near the position you have given for the new variable star you are attempting to submit. If any of these objects are within a few arc-seconds of your position (refer to the value in the **Dist.** column for the angular distance), it is highly likely that VSX already has your star, and you should close this window and then cancel your submission. If the below list shows matches for stars well away from your position, or shows no matches at all, then you can be relatively sure that VSX does not have your star, and you should close this window and proceed with your new variable star submission.

IMPORTANT: The following record was found in the queue of pending submissions to VSX. It is currently being reviewed by the moderators, and will be acted upon soon. If this data matches up well with what you are attempting to submit, then you should close this window and cancel your submission.

within 120" of 09 32:45.6 -62:45:20.0

Search Results   0 records (0 ms)

Save Search Results as CSV file: [Save]

Dist.	Name	AUID	Coords (J2000)	Const.	Var. type	Period (d)	Mag. range

There were no records that matched the search criteria.

» Close Window

Close the window and click the "Next" button. This will result in the following:

AAVSO Home

The International
Variable Star Index   Search   Submit   Register   Log In   Account   About

Current Time: 02 Oct 2018 17:19:04 UTC   David H. Hinzel, you are logged in.
                                                   » My Submissions   » Preferences   » Log out

New Star Wizard

Catalog Names   1 2 3 4 5 6 7 8 9 10 11 R

What names is this new variable object known by?

On this form suggest a primary name for the new variable star you are submitting. If the
star was found in your own data, provide a name from one of the following catalogues:
HD, SAO, CD/CPD/BD, GSC, 2MASS, UCAC4, USNO-B1.0. If the star was found in a
photometric database (e.g. CSS, NSVS, ASAS, 1SWASP) provide the name by which it is
known in that database, or the identification from the catalogue from which you selected
the candidate (e.g. SDSS). If the star was found in a publication use the full name (not an
abbreviated name) as given in the paper.

Also, please provide all catalogue names and/or designations (published or unpublished)
for the new variable star. If a corresponding object can be plainly identified in any of the
major astrometric catalogues (UCAC4, 2MASS, USNO-B1.0), or if the object was cross-
identified in the referenced discovery paper with any other named objects, these names
or IDs should be included. If more than one is available, place each name on a separate
line. It is very important that you delimit the catalog acronym from the catalog
number/name by a space character, and that you follow very closely the exact
alphanumeric sequence for the name as defined in the **Dictionary of Nomenclature of
Celestial Objects**. Some examples of **proper** formatting include: GSC 02789-01428,
USNO-B1.0 0611-0059614, 2MASS J01373609+3803570. Examples of **improper**
formatting include: GSC2789-1428, USNOB1 0611 0059614, 2MASS 01373609+3803570).

❶ Primary name   HD 82902   » **Check**
                     name

Other names   [   ]

A primary name is required.
One catalog designation per line.
Examples: 2MASS J19595804-2258147
            USNO-B1.0 0910-0526709
            GSC 06892-01916

Cancel   Back   Next

As recommended, if this star is found through the observer's own data, a name should
be provided from one of several catalogs. All of the catalogs can be accessed through VizieR
(http://vizier.u-strasbg.fr/viz-bin/VizieR). Bright stars will have HD, SAO, CPD, CD, BD, HIP,
PPM, TYC or GSC identifiers that are much more widely used (in order of priority) so they
should be preferred over 2MASS, USNO or other astrometric catalogue IDs. In this case the
star name is HD 82902. This should be entered in the "Primary name" input. Other
identifications will go into the "Other names" field. Clicking on the "Check" button yields:

Are any of the below listed objects equal to the variable star you are about to submit?

Below is a listing of objects in the VSX database that have a similar name as you have given for the new variable star you are attempting to submit. If any of these objects is the same you should close this window and then cancel your submission. If the below list shows no matches then you can be relatively sure that VSX does not have your star, and you should close this window and proceed with your new variable star submission.

Search Results   0 records (0 ms)

Save Search Results as CSV file: [Save]

Name	AUID	Coords (J2000)	Const.	Var. type	Period (d)	Mag. range

There were no records that matched the search criteria.

≫ **Close Window**

There is not another star with that name. Close the window and click on the "Next" button. This results in:

AAVSO Home

The International Variable Star Index   ✳ Search Submit Register Log In Account About

Current Time: 02 Sep 2018 20:07:13 UTC   David H. Hinzel, you are logged in.
                         ≫ My Submissions ≫ Preferences ≫ Log out

New Star Wizard

Variable Type   [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [R]

What is the variability type for this variable object?

If the type of variability for the object being submitted has been determined to any level of confidence, select the variability type abbreviation from the **Standardized type** menu. If no standard type adequately matches the type of variability for this object, or if classification involves more than one type (combination variable type), enter an acceptable type specification into the **Customized type** field. Any input to this secondary field takes precedence over any selection made from the primary menu. If the variability type is completely unknown, as yet undetermined, or is of a non-standard type not described in the VSX Variability Types document, then select * (asterisk) and provide an explanation on the Remarks page that will be presented near the end of the New Star Wizard process. If the given variable type is uncertain to any extent, be sure to check the **Uncertain** check box. Use the **Variability types** link to view the VSX Variability Types document, which lists and describes all the standard types.

        Standardized type [M   ▼]

        Customized type   [   ]   ☐ Uncertain
                        Use accepted type abbreviations.
                        ≫ **Variability types**

[Cancel]   [Back] [Next]

This panel is used to input the variable type of star. This part of VSX submission can be very challenging since there are many variable types and subtypes. Prior to selecting a variable type for VSX, the submitter should be as familiar as possible with these various types and subtypes. Detailed information can be obtained from Appendix 1 above and Appendix 4 below.

Appendix 1 discusses variable star conventions and VSX designations. Appendix 4 contains links to the various AAVSO Observing Sections. Each section contains detailed descriptions of the types of stars observed in that section as well as a "Target List" containing numerous examples of variable types and subtypes. Additionally, these are continuously being

updated with the latest observational data. Sample light curves can be found in the "Target List" link.

For this particular VSX submission, it seems that the proper variable star type is "M" or Mira. This should be selected from the "Standardized type" dropdown menu. Clicking on the "Next" button gives you:

In this case, no spectral type has been identified and should be left blank. Clicking in the "Next" yields:

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Variable Star Index

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Current Time: 02 Sep 2018 20:10:57 UTC   David H. Hinzel, you are logged in.
» My Submissions   » Preferences   » Log out

New Star Wizard

Magnitude Range   1 2 3 4 5 6 7 8 9 10 11 R

What is the magnitude range for variability of this object?

If a light curve has been established for this variable object, along with minimum and/or maximum magnitudes (or, in the absence of one of those, an amplitude), that information should be provided on this form. Enter the maximum magnitude and the minimum magnitude in the two fields below, checking **Uncertain** for either magnitude if the value given is not known to a reasonable degree of certainty. The maximum magnitude is the measurement of the star at it brightest, and minimum magnitude is the measurement of the star at it faintest. If the value provided for either magnitude is a limit, or the actual magnitude is something brighter or fainter than the value given, select the appropriate limiting designator from the drop-down menu to the left of the corresponding magnitude field. If the value provided for the minimum is not an actual magnitude, but an amplitude of variability, be sure to check **Minimum is amplitude**. In addition, the passband(s) in which each of these magnitudes were measured should be selected from both of the **Passband** menus. The commonly used passbands are listed, but if either of the magnitudes being submitted was measured in a band not listed, leave it unselected, and use the **Custom passband** field below it. The full list of passbands supported in VSX can be found **here**.

Maximum magnitude   [-- ▼] [3.9]   ☐ Uncertain

Max. mag. passband   [V (Johnson) ▼]

Custom max. passband   [ ]

Minimum magnitude   [-- ▼] [10.5]   ☐ Uncertain

Min. mag. passband   [V (Johnson) ▼]

Custom min. passband   [ ]

☐ Minimum is amplitude

[Cancel]   [Back] [Next]

The minimum and maximum magnitudes can be obtained directly from the data (for a mira like this one, you have to determine mean magnitudes of the brightest and faintest individual cycles) and entered in the appropriate input windows.

For miras and other large amplitude variables (CVs, RCBs) or stars with varying mean magnitudes, one decimal place is enough. Two decimal places would be typical for the rest of the stars and only use three decimal places when you work with very small amplitude variables or stars with remarkably good photometry (e.g. Kepler stars). Clicking the "Next" button gives you:

AAVSO Home

The International
Variable Star Index

Search   Submit   Register   Log In   Account   About

Current Time: 02 Oct 2018 17:22:16 UTC   David H. Hinzel, you are logged in.
                                    » My Submissions   » Preferences   » Log out

New Star Wizard

Periodicity   1 2 3 4 5 6 7 8 9 10 11 R

What is the period of variability for this object?

If a light curve over time has been established, and a period of variability derived, that period, epoch and rise time should be provided on this form. The value for the **Period** is expressed in days, and can be given as a whole integer or as a floating point value of any precision. The **Epoch** given should be for minimum light for all eclipsing and ellipsoidal variables, as well as for RV, RS and BY types. For all other types, the epoch should be for maximum light. Please express the epoch in Heliocentric Julian days. The **Rise/eclipse duration** is the duration of light increase from minimum to maximum for intrinsic variables, or the duration of the eclipse for eclipsing or Algol-type binaries. The value is given as a percentage of the period of the star. In the case of novae, supernovae, or nova-like objects, the **Outburst year** should be provided. If any of the values given here are uncertain to any extent, be sure to check the accompanying **Uncertain** check box.

Period	335.7	days	☐ Uncertain
Epoch	2454597.0	HJD	☐ Uncertain
Rise/eclipse duration	48	%	☐ Uncertain
Outburst year			☐ Uncertain

Cancel   Back   Next

Both the period and the epoch can be read directly from the data and entered in the appropriate windows. An epoch is a moment in time used as a reference point for some time-varying astronomical quantity, such as the celestial coordinates or elliptical orbital elements of a celestial body, because these are subject to perturbations and vary with time. A detailed explanation of epoch can be found at:

https://en.wikipedia.org/wiki/Epoch_(astronomy).

Do not give an excessive number of decimal places for the epoch, an integer number is enough for long period miras while 4 decimal places is only justified for very short period stars with good photometry.

The epoch should be an epoch of maximum for pulsating stars [excepting RV Tauri and LSP (Long Secondary Period) SR variables], reflection variables and magnetic variables and an epoch of minimum for eclipsing binaries, rotational variables, ellipsoidal variables and RV Tauri stars.

The period should be expressed in days (not hours or seconds). Also list only significant digits, if you only have two nights of data do not claim a period accuracy of 7 decimal places. It also depends on the period length and the type of star. E.g. a mira may even show period jitter so giving several decimal places is not justified.

The "light curve rise duration time" entry (for all variables other than eclipsing and exoplanet transits) is the time spent from minimum to maximum magnitude expressed as a percentage of the variability period and is required for asymmetric pulsators (e.g. RR Lyrae, cepheids, HADS. There is no need to add it for normal DSCT stars or other sinusoidal variables

or for spotted stars where the light curve shape changes. In the case of eclipsing binaries or exoplanet transits, this field becomes the eclipse duration in the case of eclipsing binary systems and represents the time spent in primary minimum from first to last contact, also expressed as a percentage of the period. The eclipse duration only applies to the EA-type binaries. You can't determine it for EW and EB systems where changes are continuous.

Clicking on the "Next" button yields:

Title   Phase Plot

Description   Phase plot with ASAS-SN and Smith data

☐ **Mark as private**

Cancel   Back   Next

Here, two supporting documents may be uploaded to VSX. In this case, both the light curve and the phase plot can be uploaded from the personal computer where these documents are stored. The title of each should be entered on the "Title" line. The description window may be left blank or provide additional information about the uploaded supporting documentation. Clicking on the "Next" button gives you this:

AAVSO Home

The International Variable Star Index

Search   Submit   Register   Log In   Account   About

Current Time: 02 Sep 2018 20:17:16 UTC   David H. Hinzel, you are logged in.
                                    » My Submissions   » Preferences   » Log out

New Star Wizard

Discoverer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | R |

Who was the original discoverer of this variable object?

For newly discovered variable objects, whether found through direct personal observations by the submitter or someone else, or if found through data mining or photographic plate review, the name of the original discoverer should be given here. This information is optional.

Discoverer   John Q. Smith
                  Used only for discovery credit on Detail Sheet.

Cancel   Back   Next

Enter your name if you are the discoverer. Click the "Next" button. This yields:

New Star Wizard

Literature Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | R |

Is there a reference to literature for this object?

If a paper or article appearing in literature, either in print or on-line, serves as a source, in whole or in part, for the information on the variable object being submitted, please provide a reference to it here. The **Reference name** is any name or title you care to give to the reference, and will become the text used for the clickable link to any on-line resource you might provide. This does not necessarily have to be the title of the paper or on-line resource, but should be brief and clearly indicative of the content being referenced. If the reference has no actual name or title, entering a **Reference citation** in its stead will do. The citation can be in the form of a bibliographic code (bibcode) or a full journal citation (including name, volume, pages, and acceptance year). Examples: 2006AAS...208.4405P or Astron. & Astrophys. 65, 363 (1978). The citation will become the text used for any clickable link if a **Reference name** is not provided. Finally, if the referenced literature is available in some form on the Internet, provide the complete URL (web address) to it in **Reference link**.

IMPORTANT! For all previously published stars (e.g. variable stars which were published in literature elsewhere before being submitted to VSX), a reference **MUST** be provided. For all original unpublished stars (e.g. variable stars which are being submitted to VSX before being published elsewhere), a reference is optional.

Reference name   [   ]
                     Required for previously published stars.
                     Optional for original upublished stars.
                     Examples: The All Sky Automated Survey
                                  OEJV #43

Reference citation   [   ]
                     Examples: 2006AAS...208.4405P
                                  Astron. & Astrophys. 65, 363 (1978)

Reference link   [   ]
                     Leave blank if no on-line resource is available.

Cancel   Back   Next

Assuming that there is no reference material in the literature regarding the discovery, this should left blank. Clicking the "Next" button gives:

New Star Wizard

Remarks   1 2 3 4 5 6 7 8 9 10 11 R

Are there any remarks to be added to this submission?

If there are any remarks or notes on the object you wish to include with this submission, you may do so now, otherwise you may leave the field on this form blank. Useful remarks might include more information about other components of the multiple system of which the variable star is a member, or they could provide greater detail on a source for some of the particulars you have supplied. Whatever you feel may be of value to a consumer of your data, or make it easier to understand and use. Once your submission is approved, the remarks you leave here will appear in the **Remarks** section of the object's Detail Sheet.

Remarks   VB A(B12m, 2.1", 138deg). H2O. SiO maser.

Appears in **Remarks** section of Detail Sheet.

Cancel   Back   Review

If you have additional information about the star that can't be included in any of the form fields, add them as remarks. An example is shown in the Remarks box above. Another example would be "Eccentric system. Visual binary. A = 8.145; B = 10.315 Hp; sep = 1",15. Combined magnitudes given in table".

Do not include personal comments in the Remarks field. Clicking the "Review" button yields:

New Star Wizard

Review Submission   1 2 3 4 5 6 7 8 9 10 11 R

Is all the information provided correct?

Please review all of the information provided during this wizard session. If everything is correct, click **Submit** to send your data to VSX for review and inclusion to the index. If any of the information shown here is incorrect, clicking **Change** will take you directly to the relevant page where those details may be modified and updated.

Position	09:32:45.19 -62:45:21.6	» Change
Catalogue names	HD 82902	» Change
Variable type	M	» Change
Spectral type	Not specified.	» Change
Magnitude range	3.9 - 10.5	» Change
Period	335.7 days	» Change
Epoch	HJD 2454597.0	» Change
Rise duration	48%	» Change
Outburst year	Not specified.	» Change
Supporting files	Light Curve	» Change
Discoverer	John Q. Smith	» Change
Reference	None provided.	» Change
Remarks	VB A(B12m, 2.1", 138deg). H2O, SiO maser.	» Change

NOTE
- Please make certain all above details are correct before submitting this new star.
- Input will be checked for errors and an opportunity will be given to correct any.
- All submissions must be approved before appearing in the live database.
- VSX moderators reserve the right to edit submissions for accuracy and clarity.
- Your network address (98.163.106.252) and user information will be logged.
- Supporting documentation is required for all original unpublished submissions.
- Literature reference is required for all previously published submissions.
- VSX is not a guaranteed permanent repository for uploaded documents.

Cancel   Back   Submit

If any of the information is incorrect or needs to be modified in any way, select the "Change" button on the line appropriate to the item being changed. This will take you back to the initial data entry page. Make the modifications and select "Save". It will send you back to the "Review Submission" page. When satisfied select "Submit". No changes may be made once the document is submitted. After the review process by the moderators, when they have approved any changes based upon their comments, the final VSX page for the submission will be published. In this example, no final VSX page is shown since this star was not actually submitted to VSX.

2. **Data Mining Example (Advanced entry) :**

Overview:

In general, the data submitted to VSX for new variables found in (public) survey data should be as complete as possible: the position, variability type, and maximum and minimum magnitude should always be given. For periodic variables also the period and epoch (time of minimum for eclipsers, and of maximum for pulsating and eruptive variables) are required.

a. Always give the identification of the object from the survey, e.g. NSVS 123456 or ASAS J123456-7840.1.

b. The positions given by surveys like NSVS and ASAS-3 are not very precise and may have errors of 10" and more. If it is possible to unambiguously link the object to one from an astrometric catalog, give the identification from that catalog (not Gaia DR2 names unless there is no other identifier available) and use its position. Depending on their brightness, stars closer than 60" from each other may be blended and measure as one object in some of the surveys, try to choose the most probable identification based on colors or magnitudes.

c. Do not attach the light curves provided by the surveys web sites, nor their data themselves. These are easily available from within VSX. Instead provide phase plots (for periodic variables) or combine light curves from several surveys into a single plot, making sure data from different surveys are distinguishable. When two or more synonyms are present in the NSVS database, combine these on a single plot as well, preferably also with different symbols and/or colors. Data from other surveys for which there is no link-out from VSX should be attached or an url should be provided.

d. Some general remarks on the use of data from particular surveys:
The date given by NSVS is MJD-50000 = JD-2450000.5. VSX expects HJD for the epoch, so add 2450000.5 to the NSVS date (and make the heliocentric correction).
Use mask 6420 for NSVS data.

In general, do not use ASAS-3 data of category D.
Beware of low quality nights and different zero points in SuperWASP data.

Submissions based only on Tycho photometric data are not acceptable.

e. Some notes about the resolution of stars by particular surveys. Stars closer than the following distance will be blended:
All Sky Automated Survey for Super Nova (ASAS-SN): ~17"
https://asas-sn.osu.edu/
Northern Sky Variability Survey (NSVS): ~55"
https://skydot.lanl.gov/nsvs/nsvs.php
Super Wide Angle Search for Planets (SuperWASP): ~60"
https://wasp.cerit-sc.cz/
All Sky Automated Survey-3 (ASAS-3): ~23" (up to 40" in the case of bright stars, e.g. mag. 8-9)
http://www.astrouw.edu.pl/asas/
AAVSO Photometric All-Sky Survey (APASS): ~12"
https://www.aavso.org/apass
Catalina Real-Time Transient Survey *Catalina Sky Survey* Telescope (CSS): ~11"
Catalina Real-Time Transient Survey *Siding Springs Survey* Telescope (SSS): ~9"
Catalina Real-Time Transient Survey *Mt. Lemmon Survey* Telescope (MLS): ~7"
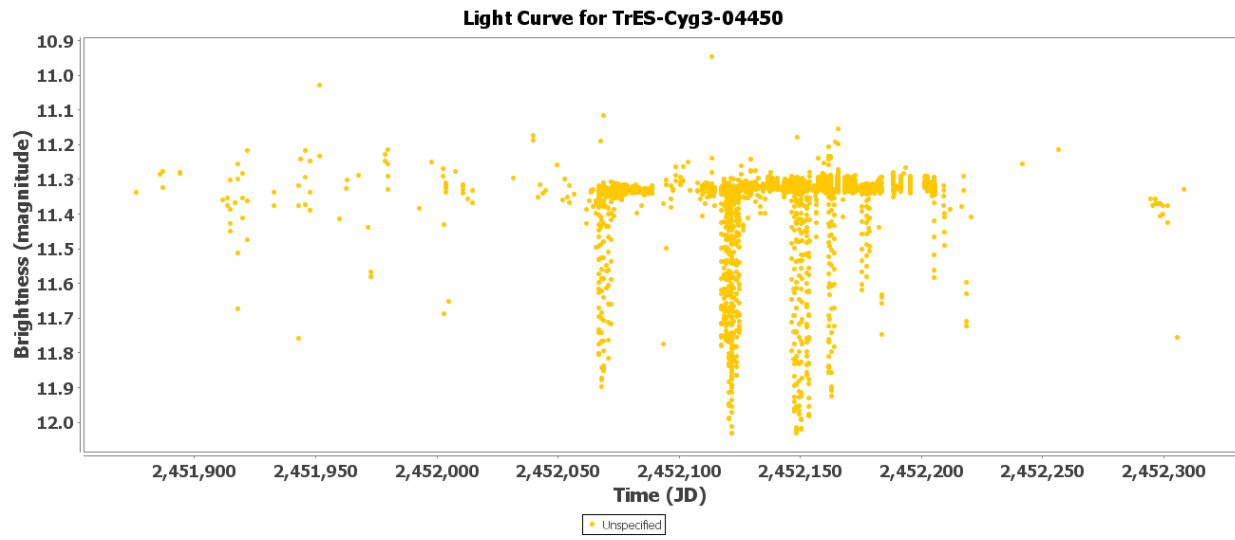http://crts.caltech.edu/

Example:

The data mining example is for a star called TrES-Cyg3-04450. TrES-Cyg3-04450 was one of 10,000 stars imaged during a wide field survey of a region of the constellation Cygnus. A field width of 6 degrees X 6 degrees was centered on R.A. 19:54:00, Dec. +37:00:00. The survey was conducted by the Transatlantic Exoplanet Survey (TrES; Alonzo et al. 2007) which was designed to search for exoplanetary transits using three wide field optical telescopes located at three different observatories (Lowell Observatory, Palomar Observatory, and the Canary Islands).
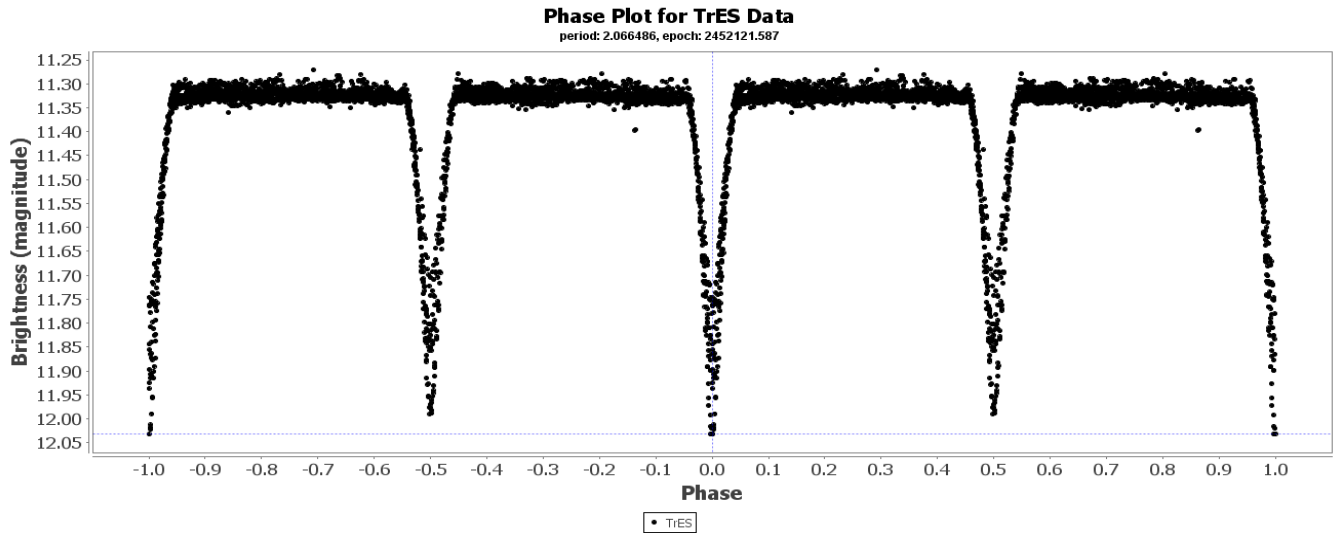
The TrES survey was based on Alonso, R. et al, 2007, in Transiting Extrasolar Planets Workshop: Proceedings of the conference held 25-28 September, 2006 at the Max Planck Institute for Astronomy in Heidelberg, Germany. The specific paper for the survey was The Transatlantic Exoplanet Survey (TrES): A Review (Alonso, R.; et al., 2007). The reference link is adsabs.harvard.edu/abs/2007ASPC..366...13A. The survey data for each star in the survey was in the database "Lowell Observatory, 2015, Stellar Photometry from TrES" (http://asteroid.lowell.edu/LARI/mged.html). Unfortunately, this program has been terminated so the link given will no longer work. However, it is an example of the type of survey that can be used for data mining.

The survey data for TrES-Cyg3-04450 (a well as all other stars in the survey) is shown below. Each star had an Excel file with survey measurement statistics and all of the photometry for the specific star. The photometric data included the HJD, the magnitude in Johnson V band, and a measurement error. Either text or Comma Separated Variable (CSV) format was available. The TrES-Cyg3-04450 data was plotted in the AAVSO VStar software. From VStar,

select the "File" tab and click on the "New Star from File" option. This will take you to the photometry file stored on your local computer. Select that file for plotting. For TrES-Cyg3-04450, the VStar light curve plot is shown below. The phase plot of TrES data alone is also shown.

2452062	0.09608	0.43882
2452062	0.05654	0.40236
2452066	0.03137	0.70307
2452066	0.04015	0.62276
2452066	0.0678	0.63568
2452066	0.16515	0.5953
2452067	0.00392	0.77532
2452067	-0.00023	0.69115
2452067	0.00185	0.76929
2452067	0.00901	0.72431
2452067	0.01851	0.69512
2452067	0.0367	0.64041
2452067	0.05006	0.73342
2452067	0.10074	0.68586
2452067	0.13438	0.6239
2452067	0.20145	0.67013
2452067	0.24345	0.67915
2452067	0.28481	0.56353
2452067	0.33945	0.75042
2452067	0.40296	0.67488
2452067	0.44461	0.7135
2452067	0.47137	0.73719
2452067	0.47239	0.68405
2452067	0.47378	0.77593
2452067	0.41289	0.66295
2452067	0.36596	0.63909
2452067	0.29593	0.60422
2452067	0.26706	0.63041
2452067	0.20099	0.55617
2452067	0.1623	0.6186
2452067	0.11727	0.50866
2452067	0.0719	0.44722
2452067	0.04307	0.45978
2452067	0.02189	0.40958
2452067	0.00524	0.46892
2452067	0.00692	0.45877

Star data: Location: 20:05:17.0, +38:14:52
Nominal magnitudes: V = 11.530
B-V = .2470

Data set statistics: Star index = 4450.
Total star count = 2000.

Magnitude statistics: Number of measurements = 3890.
Mean Magnitude = .03649.
Minimum Magnitude = -0.05931.
Maximum Magnitude = 0.70207.
Magnitude Variance = 0.01522.
Magnitude Standard Deviation = 0.12336.

Error statistics: Mean Error = 0.10901.
Minimum Error = 0.00201.
Maximum Error = 1.70185.
Error Variance = 0.02053.
Error Standard Deviation = 0.14328.

Time statistics: Observation span = 2356 days.
Nights observed = 120.
Maximum nightly obs. = 76.
Minimum nightly obs. (> 0) = 1
Average nightly obs. = 32.4.

Light Curve for TrES-Cyg3-04450

Phase Plot for TrES Data

period: 2.066486, epoch: 2452121.587

While the TrES data supplied 3890 data points, additional observations were added from the Northern Sky Variability Survey (NSVS) and the AAVSO APASS database. All the data available from multiple databases should be used to improve the star's analysis. Bright stars have NSVS data. NSVS data, as well as other survey data, can be accessed by using the VSX external links after a positional search. This will take you directly to the NSVS query parameter page. This one has three datasets; 5709370, 8460067, and 8481682. Selecting the 5709370 dataset yields the "NSVS catalog entry: Object ID 5709370" page which contains star data, a light curve, and the MJD time, magnitude, and error data. The photometry data can be copied and pasted into a local file on your computer. This should be done for all three NSVS data sets. The MJD dates from NSVS should be converted to HJD dates. Plotting all three datasets with the AAVSO VStar yields:

Phase Plot for NSVS Data

period: 2.066486, epoch: 2452121.587
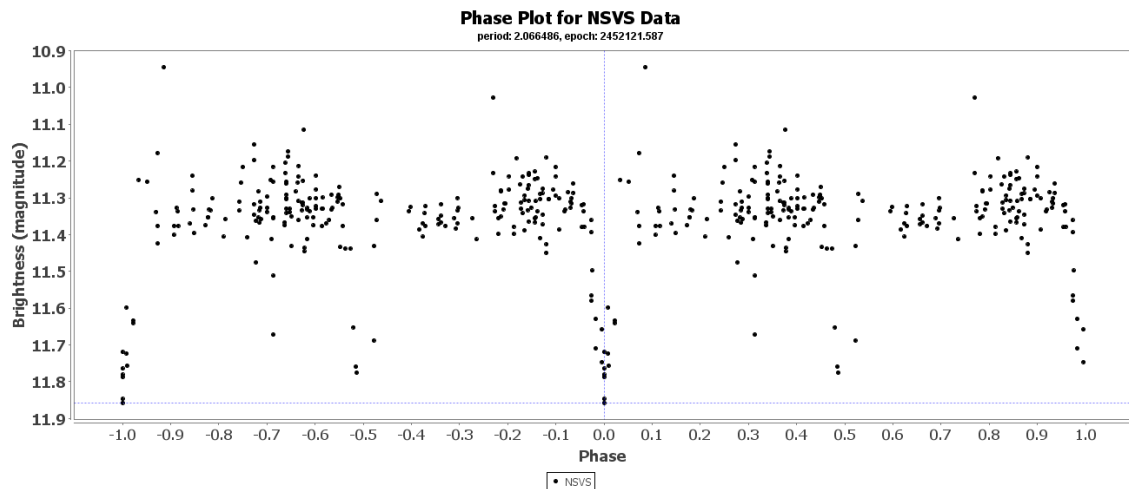
Additionally, the AAVSO APASS has some observations in Johnson V, so these can be directly added to the TrES V data. NSVS observations are unfiltered, so they need to be shifted to Johnson V and added to the other two data sets. Finally, the zero point for all of the observations can be adjusted to align with the APASS data. APASS can be accessed from the VStar APASS plugin, specifying either coordinates of the target star. For the case of TrES-Cyg3-04450, with coordinates 301.32058, +38.24772, the APASS VStar results are:
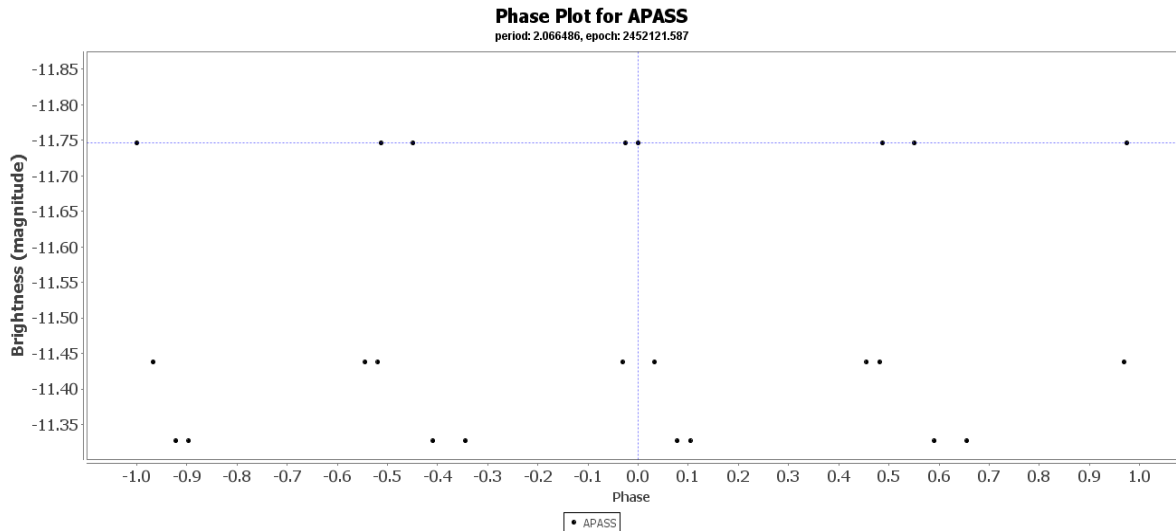
```
2455875.68    11.327
2455881.664  11.746
2455882.659  11.438

2452115.602  11.327
2452121.587  11.746
2452122.581  11.438

2452113.482  11.327
2452119.467  11.746
2452120.462  11.438

2452114.542  11.327
2452120.527  11.746
2452121.522  11.438
```


Phase Plot for APASS
period: 2.066486, epoch: 2452121.587

These can be plotted in VStar as shown.

Now that all datasets are accounted for (TrES, NSVS, APASS), the amplitude should be shifted to the V zero point (from APASS) and the ascending and descending branches of all eclipses and all datasets need to be matched. The final phase plot of all datasets matched to the zero point and eclipses is shown below.

Phase Plot for TrES-Cyg3-04550
period: 2.066486, epoch: 2452121.587
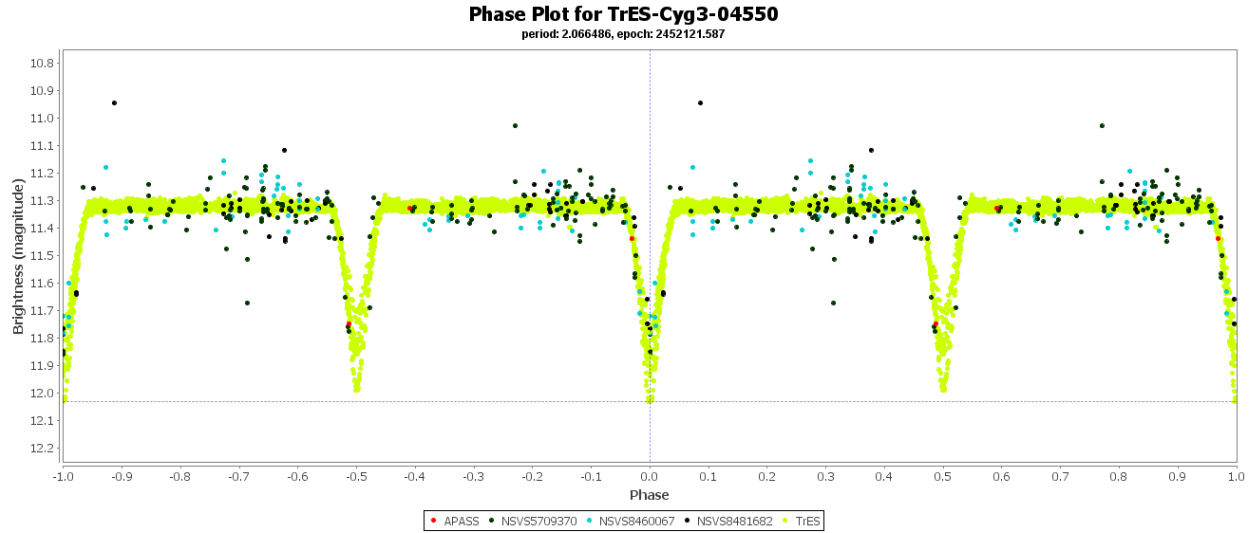
The NSVS and APASS data added observation data points as well as extending the time baseline and improved the estimation of the period by adding several eclipses. Finally, the ascending and descending branches of all eclipses and all datasets were matched such that the epoch of the minimum corresponded exactly to the midpoint of mid-eclipse. This provides ample information from the data mining analysis of TrES-Cyg3-04450 to submit to VSX.

The submission to VSX is similar to the other examples in this document. Log into the VSX page either through the "Log In" or "Submit" link. Supply your User Name and Password. The first page is shown below.

Click the "Start" button in the lower right. This will give you:

Enter the J2000.0 coordinates as shown in the paper being submitted. This may be found in the paper abstract or a table within the document. Always look at the "Spot Check" link to see if the star is already in VSX. In this example, "Spot Check" would show the star since it's already in VSX, but typically the page will be blank. Clicking on the "Next" button will give you:

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                                        » My Submissions » Preferences » Log out

New Star Wizard

Catalog Names   [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [R]

What names is this new variable object known by?

On this form suggest a primary name for the new variable star you are submitting. If the
star was found in your own data, provide a name from one of the following catalogues:
HD, SAO, CD/CPD/BD, GSC, 2MASS, UCAC4, USNO-B1.0. If the star was found in a
photometric database (e.g. CSS, NSVS, ASAS, 1SWASP) provide the name by which it is
known in that database, or the identification from the catalogue from which you selected
the candidate (e.g. SDSS). If the star was found in a publication use the full name (not an
abbreviated name) as given in the paper.

Also, please provide all catalogue names and/or designations (published or unpublished)
for the new variable star. If a corresponding object can be plainly identified in any of the
major astrometric catalogues (UCAC4, 2MASS, USNO-B1.0), or if the object was cross-
identified in the referenced discovery paper with any other named objects, these names
or IDs should be included. If more than one is available, place each name on a separate
line. It is very important that you delimit the catalog acronym from the catalog
number/name by a space character, and that you follow very closely the exact
alphanumeric sequence for the name as defined in the **Dictionary of Nomenclature of
Celestial Objects**. Some examples of **proper** formatting include: GSC 02789-01428,
USNO-B1.0 0611-0059614, 2MASS J01373609+3803570. Examples of **improper**
formatting include: GSC2789-1428, USNOB1 0611 0059614, 2MASS 01373609+3803570).

ⓘ **Primary name** | TrES-Cyg3-04450 | » Check
                                                                name

Other names | USNO-A2.0 1275-13314390
                  | USNO-B1.0 1282-0444845
                  | 2MASS J20051693+3814518
                  | NSVS 5709370
                  | NSVS 8460067
                  | NSVS 8481682

                  A primary name is required.
                  One catalog designation per line.
                  Examples: 2MASS J19595804-2258147
                                USNO-B1.0 0910-0526709
                                GSC 06892-01916

| Cancel | | Back | Next |

In this case, the primary name comes from the data mining survey results. The survey
referred to this as Cygnus 4450, but checking already published stars by TrES, the correct
format is TrES-Cyg3-04450, where the "Cyg3" is the Cygnus field number. This should be
entered in the Primary name field. The Other name field should include the names of the
catalog designation such as NSVS 5709370, 2MASS J20051693+3814518, etc.

Clicking on the "Next" button gives:

From the light curve developed from the data mining analysis, it is fairly obvious that this star is an EA β Persei-type (Algol) eclipsing binary system. This should be entered in the Standardized type field via the dropdown menu. If uncertain about the variable type, refer to Appendix 4 below which should give some assistance in determining the type. In this case, the eclipsing binary section link would be appropriate.

Clicking the "Next" button yields:

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New Star Wizard

Spectral Type   1 2 3 4 5 6 7 8 9 10 11 R

What is the spectral type for this variable object?

The spectral type of this variable object may be provided here. For multiple systems, please try to include the types for all components (use the + character between the types). For variable spectral types or uncertainties, either state a range (using a hyphen between the extents of that range) or check the Uncertain check box. If there are no data indicating a spectral type, or it is completely unknown, leave this field empty.

Spectral type [＿＿＿＿＿＿＿] ☐ Uncertain

Examples: G9.5V+K3V
SC2-S4e
M7e

Cancel   Back   Next

When this object was originally submitted to VSX, the Spectral type field was left blank as shown above. However, it was later filled in by the VSX moderator based upon the reference "Catalogue of Stellar Spectral Classification" (Skiff, 2009-2016), 1949ApJ...110..478N. Both the spectral type (F8) and the reference cited are shown below for the final VSX submission. This information also appears in the "Revision History" field of the final submission as seen at the end of this example. Clicking on the "Next" button gives you:

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New Star Wizard

Magnitude Range   1 2 3 4 5 6 7 8 9 10 11 R

What is the magnitude range for variability of this object?

If a light curve has been established for this variable object, along with minimum and/or
maximum magnitudes (or, in the absence of one of those, an amplitude), that information
should be provided on this form. Enter the maximum magnitude and the minimum
magnitude in the two fields below, checking **Uncertain** for either magnitude if the value
given is not known to a reasonable degree of certainty. The maximum magnitude is the
measurement of the star at it brightest, and minimum magnitude is the measurement of the
star at it faintest. If the value provided for either magnitude is a limit, or the actual
magnitude is something brighter or fainter than the value given, select the appropriate
limiting designator from the drop-down menu to the left of the corresponding magnitude
field. If the value provided for the minimum is not an actual magnitude, but an amplitude of
variability, be sure to check **Minimum is amplitude**. In addition, the passband(s) in
which each of these magnitudes were measured should be selected from both of the
Passband menus. The commonly used passbands are listed, but if either of the
magnitudes being submitted was measured in a band not listed, leave it unselected, and
use the **Custom passband** field below it. The full list of passbands supported in VSX
can be found **here**.

          Maximum magnitude   [-- ▾] [11.33]   ☐ Uncertain

          Max. mag. passband   [V (Johnson)   ▾]

          Custom max. passband [   ]

          Minimum magnitude   [-- ▾] [12.0]   ☐ Uncertain

          Min. mag. passband   [V (Johnson)   ▾]

          Custom min. passband [   ]

                              ☐ Minimum is amplitude

   [Cancel]   [Back] [Next]

The maximum and minimum magnitude range can be read directly from the composite
phase plot for TrES-Cyg3-04450 as shown above. The band in each case is Johnson V.
Clicking the "Next" button yields:

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New Star Wizard

Periodicity   1 2 3 4 5 6 7 8 9 10 11 R

What is the period of variability for this object?

If a light curve over time has been established, and a period of variabililily derived, that period, epoch and rise time should be provided on this form. The value for the **Period** is expressed in days, and can be given as a whole integer or as a floating point value of any precision. The **Epoch** given should be for minimum light for all eclipsing and ellipsoidal variables, as well as for RV, RS and BY types. For all other types, the epoch should be for maximum light. Please express the epoch in Heliocentric Julian days. The **Rise/eclipse duration** is the duration of light increase from minimum to maximum for intrinsic variables, or the duration of the eclipse for eclipsing or Algol-type binaries. The value is given as a percentage of the period of the star. In the case of novae, supernovae, or nova-like objects, the **Outburst year** should be provided. If any of the values given here are uncertain to any extent, be sure to check the accompanying **Uncertain** check box.

Period	2.066486	days	☐ Uncertain
Epoch	2452121.585	HJD	☐ Uncertain
Rise/eclipse duration	9	%	☐ Uncertain
Outburst year			☐ Uncertain

Cancel   Back   Next

As with the minimum/maximum magnitude, the period and epoch can be directly read off of the composite light curve. The Rise/eclipse duration can be computed from the composite light curve by measuring the width of the primary eclipse (from first to last contact) as a fraction of the width of one complete eclipse cycle. In this case, it's 9%.

Clicking on the "Next" button yields:

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New Star Wizard

Supporting Documentation   1 2 3 4 5 6 7 8 9 10 11 R

Are there any supporting files to accompany this submission?

If you are in possession of files containing information which identifies this object or supports the science used in discovering and determining the variability of this object (such as light curve plots [phase plots for periodic variables, HJD plots for irregular types] or finding charts for stars in crowded fields), and would like to make those documents available to VSX users, you may upload them from this page. Locate the files on your local system using the **Browse** buttons, provide **Titles** for the documents, and brief **Descriptions**. If you wish for the file(s) to remain private and viewable only by the VSX data moderators for review purposes, and not listed on the Detail Sheet for the star, be sure to check the **Mark as private** checkbox. For all public uploads, links to the files will be displayed in the Supporting Documents section of the Detail Sheet for the star. If there are no supporting files available, then leave all fields blank.

IMPORTANT! For all original unpublished stars (e.g. variable stars which are being submitted to VSX before being published elsewhere here), documentation supporting the science used in discovering and determining the variability of the object **MUST** be provided. In these cases, at least one supporting document must be submitted with this form. For all previously published stars (e.g. variable stars which were published in literature elsewhere before being submitted to VSX), supporting documentation is optional.

IMPORTANT! If any files are being submitted, there will be a pause when the **Next** button is clicked as the file(s) are transferred from your system to the VSX server. Click the **Next** button only once, and wait patiently for the file(s) to transfer and the next page of the Wizard to appear. The pause duration will vary according to file size, connection speed, and network traffic.

NOTE: File uploads, as a function of browser security, are not reviewable or editable in the context of a New Star Wizard session. Any files uploaded from this page are transferred to the VSX server and are permanently linked to the submission. You will not have the opportunity to jump back to this page from the final Review page to make changes. Take care in selecting the correct and appropriate files for upload.

NOTE: VSX is not intended to be a permanent archival storage place for your supporting documents. You should always maintain local copies of your files should they need to be re-submitted to this system.

File 1

File path   [Choose File]   No file chosen
Required for original unpublished stars.
Optional for previously published stars.
Maximum file size: 1 MB

Title   [TrES-Cyg3-04450 Phase Curve]

Description   [   ]

☐ Mark as private

File 2

File path   [Choose File]   No file chosen
Maximum file size: 1 MB

In this case, the supporting documentation is the composite light curve phase plot (TrES-Cyg3-04450 Phase Curve) uploaded from the submitter's local computer files.

Phase Plot for TrES-Cyg3-04550

period: 2.066486, epoch: 2452121.587
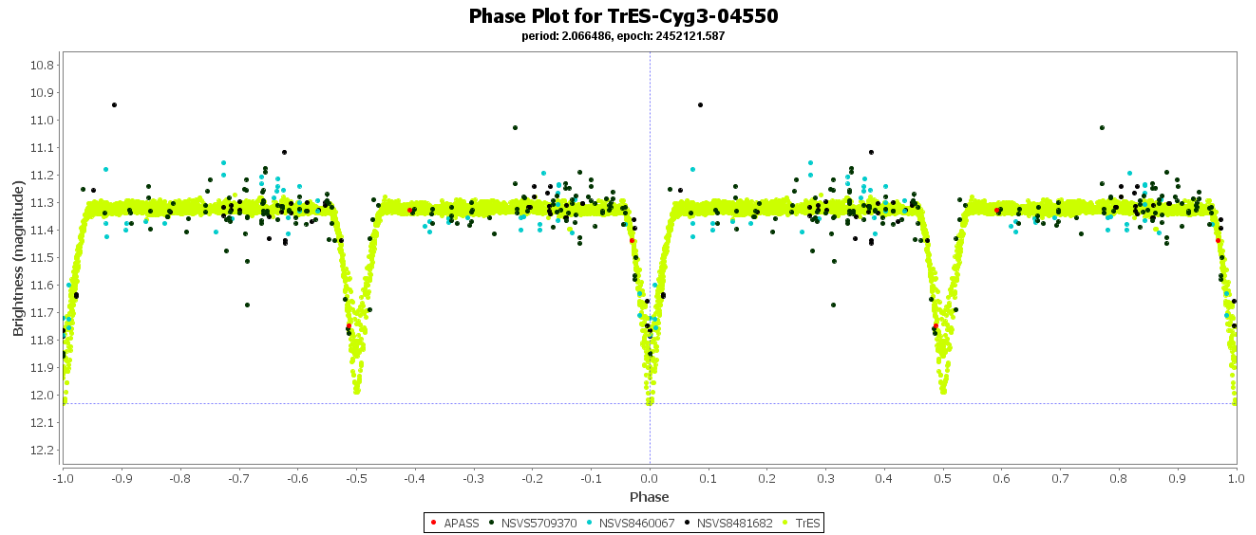
Clicking on the "Next" button, gives the Discoverer field page as shown.

Clicking on the "Next" button gives you:

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New Star Wizard

Literature Reference　　　　1 2 3 4 5 6 7 8 9 10 11 R

Is there a reference to literature for this object?

If a paper or article appearing in literature, either in print or on-line, serves as a source, in whole or in part, for the informaton on the variable object being submitted, please provide a reference to it here. The **Reference name** is any name or title you care to give to the reference, and will become the text used for the clickable link to any on-line resource you might provide. This does not necessarily have to be the title of the paper or on-line resource, but should be brief and clearly indicative of the content being referenced. If the reference has no actual name or title, entering a **Reference citation** in its stead will do. The citation can be in the form of a bibliographic code (bibcode) or a full journal citation (including name, volume, pages, and acceptance year). Examples: 2006AAS...208.4405P or Astron. & Astrophys. 65, 363 (1978). The citation will become the text used for any clickable link if a **Reference name** is not provided. Finally, if the referenced literature is available in some form on the Internet, provide the complete URL (web address) to it in **Reference link**.

IMPORTANT! For all previously published stars (e.g. variable stars which were published in literature elsewhere before being submitted to VSX), a reference **MUST** be provided. For all original unpublished stars (e.g. variable stars which are being submitted to VSX before being published elsewhere here), a reference is optional.

Reference name　| The Transatlantic Exoplanet Survey (TrES): A Rev |

Required for previously published stars.
Optional for original upublished stars.
Examples: The All Sky Automated Survey
　　　　　　　　OEJV #43

Reference citation　| 2007ASPC..366..13A |

Examples: 2006AAS...208.4405P
　　　　　　　Astron. & Astrophys. 65, 363 (1978)

Reference link　| http://adsabs.harvard.edu/abs/2007ASPC..366..13 |

Leave blank if no on-line resource is available.

[Cancel]　　　　　　　　　　　　　　　　　[Back]　[Next]

The Reference name is the paper that this object was derived from Alonso, R.; Brown, T. M.; Charbonneau, D.; et al., 2004, "The Transatlantic Exoplanet Survey (TrES): A Review".

The Reference citation (2007ASPC..366...13A) is the bibcode of the journal that this particular paper was published in (2007 Astronomical Society of the Pacific Conference).

Finally, the reference link is the online resource where the paper can be found (http://adsabs.harvard.edu/abs/2007ASPC..366...13A).

Clicking the "Next" button yields:

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Variable Star Index

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Current Time : 29 Aug 2018 12:41:52 UTC   David H. Hinzel, you are logged in.
                              ≫ My Submissions   ≫ Preferences   ≫ Log out

New Star Wizard

Remarks   1 2 3 4 5 6 7 8 9 10 11 R

Are there any remarks to be added to this submission?

If there are any remarks or notes on the object you wish to include with this submission,
you may do so now, otherwise you may leave the field on this form blank. Useful remarks
might include more information about other components of the multiple system of which
the variable star is a member, or they could provide greater detail on a source for some of
the particulars you have supplied. Whatever you feel may be of value to a consumer of
your data, or make it easier to understand and use. Once your submission is approved,
the remarks you leave here will appear in the Remarks section of the object's Detail
Sheet.

Remarks   B-V = 0.50; J-K = 0.19

Appears in Remarks section of Detail Sheet.

Cancel   Back   Review

       This is where additional information about the star being submitted may be added.
Information in this field does not have a submission field as part ot the submission page (e.g.,
period/epoch). In this case, the B-V and J-K information is added since there is not page
specifically set up for that data. Clicking the "Next" button gives you the "Review Submission"
Page.

AAVSO Home

The International
Variable Star Index
Search   Submit   Register   Log In   Account   About

Current Time: 29 Aug 2018 12:42:53 UTC   David H. Hinzel, you are logged in.
                                               » My Submissions   » Preferences   » Log out

New Star Wizard

Review Submission   1 2 3 4 5 6 7 8 9 10 11 R

Is all the information provided correct?

Please review all of the information provided during this wizard session. If everything is correct, click **Submit** to send your data to VSX for review and inclusion to the index. If any of the information shown here is incorrect, clicking **Change** will take you directly to the relevant page where those details may be modified and updated.

Position	20 05 16.94 +38 14 51.8	» Change
Catalogue names	TrES-Cyg3-04450 UCAC4 642-085405 USNO-A2.0 1275-13314390 USNO-B1.0 1282-0444845 2MASS J20051693+3814518 NSVS 5709370 NSVS 8460067 NSVS 8481682	» Change
Variable type	EA	» Change
Spectral type	*Not specified.*	» Change
Magnitude range	11.33 - 12.0	» Change
Period	2.066486 days	» Change
Epoch	HJD 2452121.585	» Change
Rise duration	9%	» Change
Outburst year	*Not specified.*	» Change
Supporting files	TrES-Cyg3-04450 Phase Curve	» Change
Discoverer	David H. Hinzel	» Change
Reference	The Transatlantic Exoplanet Survey (TrES): A Review (Alonso, R.;et.al 2007) 2007ASPC..366..13A http://adsabs.harvard.edu/abs/2007ASPC..366..13A	» Change
Remarks	B-V = 0.50; J-K = 0.19	» Change

NOTE
• Please make certain all above details are correct before submitting this new star.
• Input will be checked for errors and an opportunity will be given to correct any.
• All submissions must be approved before appearing in the live database.
• VSX moderators reserve the right to edit submissions for accuracy and clarity.
• Your network address (98.163.106.252) and user information will be logged.
• Supporting documentation is required for all original unpublished submissions.
• Literature reference is required for all previously published submissions.
• VSX is not a guaranteed permanent repository for uploaded documents.

Cancel   Back   Submit

        If any of the information is incorrect or needs to be modified in any way, select the
"Change" button on the line appropriate to the item being changed. This will take you back to
the initial data entry page. Make the modifications and select "Save". It will send you back to the
"Review Submission" page. When satisfied select "Submit". No changes may be made once the
document is submitted. After the review process by the moderators, when they have approved
any changes based upon their comments, the final VSX page for the submission will look like
this:

AAVSO Home

The International
Variable Star Index

Search   Submit   Register   Log In   Account   About

Current Time: 29 Aug 2018 12:44:09 UTC   David H. Hinzel, you are logged in.

» My Submissions   » Preferences   » Log out

» Revise   » New Search

Latest Details

Inclusion of aliases from SIMBAD may be set from Preferences.

Name	**V TrES-Cyg3-04450**
Personal alias	-- » Add personal alias
AAVSO UID	000-BLL-484 (145 observations)
Constellation	Cygnus » Sequence
J2000.0	20 05 16.94 +38 14 51.8 (301.32058 +38.24772) » Search nearby
B1950.0	20 03 28.25 +38 06 14.9
Proper motion	RA: -10.582 +/- 1.568 mas/y Dec: -14.050 +/- 1.252 mas/y Source: **Gaia DR1**
Galactic coord.	74.660 +3.495

Other names (Internal only)		
2MASS J20051693+3814518	LF 3b +38 265	NSVS 5709370
NSVS 8460067	NSVS 8481682	UCAC4 642-085405
USNO-A2.0 1275-13314390	USNO-B1.0 1282-0444845	
		» Add name

Variability type	EA ❷
Spectral type	F8
Mag. range	11.33 - 12.0 V ❷
Discoverer	David H. Hinzel
Epoch	31 Jul 2001 (HJD 2452121.587) » Ephemeris
Outburst	--
Period	2.066486 d
Rise/eclipse dur.	9%

Remarks

Some references may be clicked to view in new window. Roll over index number to view submission details.

1	Hinzel, David H.	B-V= 0.50; J-K= 0.19.

» Add remark

References

Click reference title/citation to view in new window. Roll over index number to view submission details.

1	The Transatlantic Exoplanet Survey (TrES):A Review (Alonso, R.;et al, 2007)	2007ASPC..366...13A
2	Catalogue of Stellar Spectral Classifications (Skiff, 2009-2016)	1949ApJ...110..478N

External Links

Links open in a new window. Not all links may be valid for this particular target.

Location   -- Select -- ▼   » Go   Select a **Location** for more details.

Information from selected catalogs obtained by cross-matching to 2 arc seconds using the **CDS X-Match Service**. These data may not be complete.

2MASS	J = 10.26	H = 10.09	K = 10.07	J - K = 0.19		
AllWISE	W1 = 10.06	W2 = 10.09	W3 = 9.93	W1 - W2 = -0.02		
APASS-DR9	B = 12.00	V = 11.50	g' = 11.69	r' = 11.38	i' = 11.26	B - V = 0.50

Images   [?]

Please review Digitized Sky Survey **Acknowledgment** and **Copyright**.

Image not downloaded. Click **Retrieve Image** to download and view.   ≫ **Retrieve image**

Supporting Documents   [?]

Click document name to open or save. Browser plug-in or other software may be required for viewing.

1	TrES-Cyg3-04450 Phase Curve	Hinzel, David H.	2014-12-21 20:01 UTC

≫ **Add document**

Revision History   [?]

Currently approved revision is checked. Click revision number to view details of that revision.

✓	2	Admin, VSX	2017-12-15 09:16 UTC	Spectral type from Skiff (VizieR on-line data: B/mk)
	1	Hinzel, David H.	2014-12-22 21:29 UTC	Initial submission.

≫ **Guidelines**   ≫ **FAQ**   ≫ **Forum**   ≫ **Variability Types**   ≫ **Passbands**   ≫ **Copyright**   ≫ **Acknowledgments**   ≫ **Privacy**   ≫ **Contact**   ≫ **Help us**

Note: not shown is the "Initial submission" field since this object has already been submitted to VSX. However, it can be seen from the above the name of the submitter and the "Initial Submission" comment in the "Revision History" field.

3. New Star Form (novice and advanced) example:

The New Star Form is another way to submit your discoveries to the VSX database. Some users find it more comfortable (all fields in one screen) so we showcase some examples of how it looks. The information you have to enter is the same as described in the New Star Wizard examples (see Appendix 2, section 1 and the information given throughout this manual).

Do not mark the novice checkbox if you are an advanced user just because there are no survey data for your star. The "novice discoveries" are made available through a VSX special search so other people can improve them.

Coordinates are designations should be added as usual.

New Star Form

Red bar fields are required. Dependent on submission type, other fields may be required.

ALWAYS CHECK FOR DUPLICATES! Enter the position, then click **Spot check**

IMPORTANT NOTE REGARDING CROWDED FIELDS: Submission of new variable stars in crowded fields may require an accompanying CCD finding chart with sufficient scale to unambiguously identify the variable.

Novice discovery

Check for discoveries based only on own observations. Full analysis is recommended however.

Position (J2000.0)   » **Spot check**

Examples: 21 42 42.84 +43 35 10.2
07:04:04.22 -03:50:51.7
34.83722 -2.97818

Primary name   » **Check name**

Other names

One catalog designation per line.
Examples: 2MASS J19595804-2258147
USNO-B1.0 0910-0526709
GSC 06892-01916

Next, a drop-down menu enables you to select variability type for your star. We list the most common types. The Custom variable type is a free text field that can be used to enter a type not listed in the menu. Check the VSX Variability types document available at https://www.aavso.org/vsx/index.php?view=about.vartypes if you are not sure on how to classify your object. Other required information needs to be filled:

Standard variable type	-- ⬍	» Variability types
Custom variable type	☐ Uncertain	
	Use accepted type abbreviations whenever possible.	
Spectral type	☐ Uncertain	
	Examples: G9.5V+K3V	
	SC2-S4e	
	M7e	

Maximum magnitude	-- ⬍	☐ Uncertain	
	The magnitude measurement of the star at its brightest.		
Max. mag. passband	-- ⬍	» Passbands	
Custom max. passband			
Minimum magnitude	-- ⬍	☐ Uncertain	
	The magnitude measurement of the star at its faintest.		
Min. mag. passband	-- ⬍	» Passbands	
Custom min. passband			
☐ **Minimum is amplitude**			

Period		days	☐ Uncertain
Epoch		HJD	☐ Uncertain
Rise/eclipse duration		%	☐ Uncertain
Outburst (nova) year			☐ Uncertain

New star submissions need to be accompanied by supporting files, which can be uploaded next:

For appended records of known stars, a reference is required. Then you can add remarks and a revision comment.

Remarks are meant to include information on the star's nature (multiple variability types, other periods, Min II information) or the photometry (blending, companions). The revision comment should list all the information that has been revised along with the corresponding sources. E.g.: "Type, period, epoch and range from ASAS-SN data. Gaia DR2 position."

In the New star form the revision comment is by default "Initial submission", but it can be replaced by a source used to improve the original data. E.g.: aA submission based on ASAS-SN data may also have a spectral type and position taken from other sources ("Spectral type from 1991MNRAS.249..409L. Gaia DR2 position.")

Reference name

Required for previously published stars.
Optional for original unpublished stars.
Examples: The All Sky Automated Survey
OEJV #43

Reference citation

Examples: 2006AAS...208.4405P
Astron. & Astrophys. 65, 363 (1978)

Reference link

Leave empty if there is no on-line resource available.

Remarks

Appears in **Remarks** section of Detail Sheet.
Examples: Min II = 8.51 V.
Other period 93 d.
Also a DSCT variable with P=0.053 d.

Revision comment

Initial submission.

Appears in **Revision History** section of Detail Sheet.
Examples: Type and range from NSVS data.
Elements from 2016JAVSO..44..156K.
UCAC4 position.

Upon completing the above, be sure that all information is correct and submit your discovery. Your submission will be transferred to a moderator, who will check your data and let you know if there are missing items. Overall, please make sure your submissions are as complete as possible. This will minimize the time it takes for your star to be formally published on VSX.

Check the "Draft only" box if you want to save your submission and complete it at a later time (the "Submit New Star" link will work as a "Save" button). The "Draft only" box is also useful to add more than one set of references or more supporting files. Every time you save the form a a draft you will be able to add a new reference or file when you reopen the form.

Uncheck the "Draft only" box to submit the final version of your submission.

4. Paper Submission/Revision Example:

Overview:

A number of variable star catalogs has been imported into VSX. However a large number of variables have been described in the literature, which have not been assigned a GCVS name and have not been incorporated into VSX. For other variables up-to-date information exists in the literature (e.g. corrections of GCVS or survey data) but it has not yet been entered into VSX. Your help to make VSX more complete and up-to-date is also welcome.

Provide all data found in the paper. Use the position as given the paper, or provide a better position (from an astrometric catalog) based on the information given in the paper. Information which cannot readily be placed into the standard VSX fields, should be added as a comment (e.g.: magnitude at secondary minimum for an eclipsing binary, epoch of secondary minimum for an eccentric eclipser, etc.)

Provide the bibcode of the publication and the link to the ADS abstract page (http://adsabs.harvard.edu/abs/...) when it exists. For preprints published on astro-ph, give the url of the ADS abstract page as well (e.g. http://adsabs.harvard.edu/abs/2014arXiv1401.0635T). When a bibcode does not exist, give the url of the online publication whenever possible. When a publication cannot be accessed online, provide a scanned copy, so that the moderators can verify your submission. Notes in email discussion groups such as vsnet-alert, cvnet-discussion, etc. are acceptable as references when they provide enough information to decide that the object is a variable (in principle the same rules as in sections I and II are valid here). If you have more than one reference to give (e.g. data from multiples sources), you can save a draft of your

submission in the New Star Form and then you will be able to edit your draft and add them (saving a draft version after each reference you added).

If there are more than 10 or so new objects or revisions available electronically in tabular form from a single publication, send a message to VSX at aavso.org. Often these can be more easily imported into VSX, rather than be entered manually. Preparing a list (a text file or an Excel spreadsheet) with the relevant data separated in columns will save you (and VSX moderators) a lot of time.

Example:

For the purpose of this example, refer to:
https://adsabs.harvard.edu/abs/2016MNRAS.460.4220L

Log into the VSX page either through the "Log In" or "Submit" link. Supply your User Name and Password. The first page is shown below.

New Star Wizard

Introduction

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | R |

The VSX **New Star Wizard** provides an intuitively helpful, easy to understand, 12-step process for adding a new variable star to the index. Each page of this wizard asks a question, describes in detail what information is required, and displays a simple entry form in which to supply an answer. The cumulative answers comprise the requisite data for submission of the new variable star to this index.

As you step through the pages of the wizard, bear in mind that the wizard remembers whatever you type into each of the forms presented. As long as the current browser session remains active, and the **Cancel** button is not clicked, you can step backward or forward through the pages to review or make changes to any details you may have provided. An overview of all the information supplied to the wizard is displayed at the final step, just prior to submitting the data. If at any time you wish to cancel out of the wizard and discard the details of the submission, click **Cancel**.

Data regarding object position, catalogue names and cross-identifications, type, spectra, magnitudes, periodicity, methods of measurement, as well as supporting documents and references for each source may be required by the wizard. Have all the relevant information handy before continuing. Depending on the type of information requested, some form elements may be left blank or unselected if those data are not available or are not known. For those form fields that must receive required data, their titles will be preceded by the ⓘ icon.

If you are ready to continue, click **Start**.

Cancel   Start

Click the "Start" button in the lower right. This will give you:

Enter the J2000.0 coordinates as shown in the paper being submitted. Whenever available, please adopt the Gaia DR2 position for the object as computed by VizieR. This may be found in the paper abstract or a table within the document. Always look at the "Spot Check" link to see if the star is already in VSX. In this example, "Spot Check" results in this:

Are any of the below listed objects equal to the variable star you are about to submit?

Below is a listing of objects in the VSX database that are near the position you have given for the new variable star you are attempting to submit. If any of these objects are within a few arc-seconds of your position (refer to the value in the **Dist.** column for the angular distance), it is highly likely that VSX already has your star, and you should close this window and then cancel your submission. If the below list shows matches for stars well away from your position, or shows no matches at all, then you can be relatively sure that VSX does not have your star, and you should close this window and proceed with your new variable star submission.

within **120"** of **19:44:39.547 +41:33:21.17**

Search Results   2 records (0 ms)

Save Search Results as CSV file: Save

Dist.	Name	AUID	Coords (J2000)	Const.	Var. type	Period (d)	Mag. range
0.0	V KIC 6220497	000-BMD-279	19 44 39.55 +41 33 21.2	Cyg	EA/SD+DSCT	1.323167	14.71 - 15.22 Kp
119.0	V KIC 6220616	--	19 44 46.21 +41 31 48.6	Cyg	ROT	2.868	11.98 (0.001) Kp

» **Close Window**

There are two entries. The first is the star being submitted, but this is because this star was already in the VSX database, having been reviewed and submitted by a contributor. However this is not normally the case….generally this field will be blank. The second entry is a star at a distance of 119 " from the target star. While close, it clearly is not the star being submitted, so the VSX Wizard process can continue. Close the window and click on the "Next" button. This will give you:

New Star Wizard

Catalog Names   1 2 3 4 5 6 7 8 9 10 11 R

What names is this new variable object known by?

On this form suggest a primary name for the new variable star you are submitting. If the star was found in your own data, provide a name from one of the following catalogues: HD, SAO, CD/CPD/BD, GSC, 2MASS, UCAC4, USNO-B1.0. If the star was found in a photometric database (e.g. CSS, NSVS, ASAS, 1SWASP) provide the name by which it is known in that database, or the identification from the catalogue from which you selected the candidate (e.g. SDSS). If the star was found in a publication use the full name (not an abbreviated name) as given in the paper.

Also, please provide all catalogue names and/or designations (published or unpublished) for the new variable star. If a corresponding object can be plainly identified in any of the major astrometric catalogues (UCAC4, 2MASS, USNO-B1.0), or if the object was cross-identified in the referenced discovery paper with any other named objects, these names or IDs should be included. If more than one is available, place each name on a separate line. It is very important that you delimit the catalog acronym from the catalog number/name by a space character, and that you follow very closely the exact alphanumeric sequence for the name as defined in the **Dictionary of Nomenclature of Celestial Objects**. Some examples of **proper** formatting include: GSC 02789-01428, USNO-B1.0 0611-0059614, 2MASS J01373609+3803570. Examples of **improper** formatting include: GSC2789-1428, USNOB1 0611 0059614, 2MASS 01373609+3803570).

① Primary name   KIC 06220497   **» Check name**

Other names   2MASS J19443954+4133211
UCAC4 658-078826

A primary name is required.
One catalog designation per line.
Examples: 2MASS J19595804-2258147
USNO-B1.0 0910-0526709
GSC 06892-01916

Cancel   Back   Next

The primary name will come from the reference paper. Please double-check that the primary name is accurate. Include other names if possible. Often the paper itself will mention several other names. If not, check other search sources such as SIMBAD and VizieR (VizieR will also give you cross-identifications and photometry from existing catalogs, useful information to submit with your report). When you search by position in VSX you will get links to search by

position in a number of other catalogs without having to enter the position again. (See section "IV. Submitting your results to VSX" for details on name nomenclature)

Clicking the "Next" button gives:

This page contains two fields for variability, the standardized type and the customized type. The standardized type is a drop down menu containing all of the basic variability types such as "EA" or "DSCT". Information for the standardized types can be found by clicking the "Variability types" link. For the customized type input, this can normally be found in the paper being submitted, often in the abstract or in a table in the document text. For this particular submission, the customized type was EA/SD+DSCT which is a semi-detached Algol eclipsing system with a Delta Scuti component. Clicking the "Next" button yields:

The International
Variable Star Index

New Star Wizard

Spectral Type   1 2 3 4 5 6 7 8 9 10 11 R

What is the spectral type for this variable object?

The spectral type of this variable object may be provided here. For multiple systems,
please try to include the types for all components (use the + character betw een the
types). For variable spectral types or uncertainties, either state a range (using a hyphen
betw een the extents of that range) or check the Uncertain check box. If there are no data
indicating a spectral type, or it is completely unknow n, leave this field empty.

Spectral type | A9V | ☐ Uncertain

Examples: G9.5V+K3V
           SC2-S4e
           M7e

| Cancel | | Back | Next |

     The spectral type is generally discussed in the paper and should be included. If there is no mention of spectral type, this field should be left blank. If the authors are uncertain, then the "Uncertain" box should be checked. Clicking the "Next" button gives you:

Magnitude Range   1 2 3 4 5 6 7 8 9 10 1

What is the magnitude range for variability of this object?

If a light curve has been established for this variable object, along with minimum and maximum magnitudes (or, in the absence of one of those, an amplitude), that informa should be provided on this form. Enter the maximum magnitude and the minimum magnitude in the two fields below, checking **Uncertain** for either magnitude if the va given is not known to a reasonable degree of certainty. The maximum magnitude is t measurement of the star at it brightest, and minimum magnitude is the measurement star at it faintest. If the value provided for either magnitude is a limit, or the actual magnitude is something brighter or fainter than the value given, select the appropriat limiting designator from the drop-down menu to the left of the corresponding magnitu field. If the value provided for the minimum is not an actual magnitude, but an amplitu variability, be sure to check **Minimum is amplitude**. In addition, the passband(s) i which each of these magnitudes were measured should be selected from both of th **Passband** menus. The commonly used passbands are listed, but if either of the magnitudes being submitted was measured in a band not listed, leave it unselected, use the **Custom passband** field below it. The full list of passbands supported in V can be found **here**.

Maximum magnitude	-- ▼	14.71	☐ Uncerta
Max. mag. passband	Kp (Kepler magnitude ▼		
Custom max. passband			
Minimum magnitude	-- ▼	15.22	☐ Uncerta
Min. mag. passband	Kp (Kepler magnitude ▼		
Custom min. passband			
	☐ Minimum is amplitude		

Cancel   Back   N

The maximum and minimum magnitude is given in the paper, as is the passband of each. For this particular example, the maximum and minimum magnitude is shown in Figure 1 of the paper being submitted. As shown in the figure, the reported magnitude is Kp or Kepler magnitude. Kp can be found in the max/min passband drop down menu on this page. Clicking the "Next" button yields:

The International Variable Star Index

Search Submit Register Log In Accou

Current Time: 13 Aug 2018 16:00:32 UTC

David H. Hinzel, you

» My Submissions   » Preference

New Star Wizard

Periodicity   1 2 3 4 5 6 7 8 9 10 11 R

What is the period of variability for this object?

If a light curve over time has been established, and a period of variabilility derived, that period, epoch and rise time should be provided on this form. The value for the **Period** is expressed in days, and can be given as a whole integer or as a floating point value of any precision. The **Epoch** given should be for minimum light for all eclipsing and ellipsoidal variables, as well as for RV, RS and BY types. For all other types, the epoch should be for maximum light. Please express the epoch in Heliocentric Julian days. The **Rise/eclipse duration** is the duration of light increase from minimum to maximum for intrinsic variables, or the duration of the eclipse for eclipsing or Algol-type binaries. The value is given as a percentage of the period of the star. In the case of novae, supernovae, or nova-like objects, the **Outburst year** should be provided. If any of the values given here are uncertain to any extent, be sure to check the accompanying **Uncertain** check box.

Period: 1.323167 days ☐ Uncertain

Epoch: 2456204.39612 HJD ☐ Uncertain

Rise/eclipse duration: 23 % ☐ Uncertain

Outburst year: ☐ Uncertain

Cancel   Back   Next

Both the period and the epoch are typically found in a table in the document text. The rise/eclipse time generally have to be calculated from figures in the example text, in this case Figures 1 and 3. This yields a rise/eclipse duration of 23%. "Outburst year" is only for nova type submissions and should be left blank.

Clicking the "Next" button yields:

The International
Variable Star Index

Search　Submit　Register　Log In　Account　About

Current Time: 27 Oct 2018 18:46:44 UTC　　　　　　　**David H. Hinzel, you are logged in.**

> My Submissions　> Preferences　> Log out

New Star Wizard

Supporting Documentation　　　　　　　　　10　11　12　R

Are there any supporting files to accompany this submission?

If you are in possession of files containing information which identifies this object or supports
the science used in discovering and determining the variability of this object (such as light curve
plots [phase plots for periodic variables, HJD plots for irregular types] or finding charts for stars
in crowded fields), and would like to make those documents available to VSX users, you may
upload them from this page. Locate the files on your local system using the **Browse** buttons,
provide **Titles** for the documents, and brief **Descriptions**. If you wish for the file(s) to remain
private and viewable only by the VSX data moderators for review purposes, and not listed on
the Detail Sheet for the star, be sure to check the **Mark as private** checkbox. For all public
uploads, links to the files will be displayed in the Supporting Documents section of the Detail
Sheet for the star. If there are no supporting files available, then leave all fields blank.

IMPORTANT! For all original unpublished stars (e.g. variable stars which are being submitted to
VSX before being published elsewhere), documentation supporting the science used in
discovering and determining the variability of the object **MUST** be provided. In these cases, at
least one supporting document must be submitted with this form. For all previously published
stars (e.g. variable stars which were published in literature elsewhere before being submitted to
VSX), supporting documentation is optional.

IMPORTANT! If any files are being submitted, there will be a pause when the **Next** button is
clicked as the file(s) are transfered from your system to the VSX server. Click the **Next** button
only once, and wait patiently for the file(s) to transfer and the next page of the Wizard to appear.
The pause duration will vary according to file size, connection speed, and network traffic.

NOTE: File uploads, as a function of browser security, are not reviewable or editable in the
context of a New Star Wizard session. Any files uploaded from this page are transfered to the
VSX server and are permanently linked to the submission. You will not have the opportunity to
jump back to this page from the final Review page to make changes. Take care in selecting the
correct and appropriate files for upload.

NOTE: VSX is not intended to be a permanent archival storage place for your supporting
documents. You should always maintain local copies of your files should they need to be re-
submitted to this system.

File 1

　　　　　　　File path　　Choose File　No file chosen
　　　　　　　　　　　　　Required for original unpublished stars.
　　　　　　　　　　　　　Optional for previously published stars.
　　　　　　　　　　　　　Maximum file size: 1 MB

　　　　　　　Title

　　　　Description

　　　　　　　　　　　　Mark as private

File 2

　　　　　　　File path　　Choose File　No file chosen
　　　　　　　　　　　　　Maximum file size: 1 MB

　　　　　　　Title

Title	
Description	

☐ Mark as private

Cancel   Back   Next

Generally, there is no additional supporting evidence necessary outside of that which is already in the paper being reviewed.

Clicking the "Next" button gives you this:

AAVSO Home

The International
Variable Star Index   Search   Submit   Register   Log In   Account   About

Current Time: 13 Aug 2018 16:02:59 UTC   David H. Hinzel, you are logged in.
                                    ≫ My Submissions   ≫ Preferences   ≫ Log out

New Star Wizard

Discoverer   1 2 3 4 5 6 7 8 9 10 11 R

Who was the original discoverer of this variable object?

For newly discovered variable objects, whether found through direct personal observations by the submitter or someone else, or if found through data mining or photographic plate review, the name of the original discoverer should be given here. This information is optional.

Discoverer   Albert Einstein
              Used only for discovery credit on Detail Sheet.

Cancel   Back   Next

This field is normally left blank unless the discoverer is mentioned in the paper. Sometimes the discoverer is the author of the paper, other times the discoverer is just mentioned in the paper. Clicking the "Next" button yields:

AAVSO Home

The International
Variable Star Index

Search   Submit   Register   Log In   Account   About

Current Time: 13 Aug 2018 16:06:51 UTC   David H. Hinzel, you are logged in.

» My Submissions   » Preferences   » Log out

New Star Wizard

Literature Reference   [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [R]

Is there a reference to literature for this object?

If a paper or article appearing in literature, either in print or on-line, serves as a source, in whole or in part, for the informaton on the variable object being submitted, please provide a reference to it here. The **Reference name** is any name or title you care to give to the reference, and will become the text used for the clickable link to any on-line resource you might provide. This does not necessarily have to be the title of the paper or on-line resource, but should be brief and clearly indicative of the content being referenced. If the reference has no actual name or title, entering a **Reference citation** in its stead will do. The citation can be in the form of a bibliographic code (bibcode) or a full journal citation (including name, volume, pages, and acceptance year). Examples: 2006AAS...208.4405P or Astron. & Astrophys. 65, 363 (1978). The citation will become the text used for any clickable link if a **Reference name** is not provided. Finally, if the referenced literature is available in some form on the Internet, provide the complete URL (web address) to it in **Reference link**.

IMPORTANT! For all previously published stars (e.g. variable stars which were published in literature elsewhere before being submitted to VSX), a reference **MUST** be provided. For all original unpublished stars (e.g. variable stars which are being submitted to VSX before being published elsewhere), a reference is optional.

Reference name | Lee, J.; et al., 2016, KIC 6220497: A New Algol-tyr |

Required for previously published stars.
Optional for original upublished stars.
Examples: The All Sky Automated Survey
             OEJV #43

Reference citation | 2016MNRAS.460.4220L |

Examples: 2006AAS...208.4405P
             Astron. & Astrophys. 65, 363 (1978)

Reference link | http://adsabs.harvard.edu/abs/2016MNRAS.460.4 |

Leave blank if no on-line resource is available.

[Cancel]   [Back] [Next]

Please pay close attention to the format of these three fields, i.e., commas, periods, etc. should be as shown, otherwise the submission will be set to the reviewing stage until corrections are made. For example:

Reference Name: Lee, J.; et al., 2016, KIC6220497: A New Algol-type Eclipsing Binary with Multiperiodic Pulsations

Reference Citation: 2016MNRAS.460.4220L

Reference Link: https://adsabs.harvard.edu/abs/2016MNRAS.460.4220L

Clicking the "Next" button gives you:

This field is for additional information that does not fit in a particular field within the Wizard. This information may be found at various places in the document. In this case it is some information about the pulsation frequencies and amplitudes within the system. If there is no significant additional information it should be left blank.

Clicking the "Review" button yields this:

New Star Wizard

Review Submission   1 2 3 4 5 6 7 8 9 10 11

Is all the information provided correct?

Please review all of the information provided during this wizard session. If everything is correct, click **Submit** to send your data to VS
for review and inclusion to the index. If any of the information shown here is incorrect, clicking **Change** will take you directly to the
relevant page where those details may be modified and updated.

Position	19:44:39.547 +41:33:21.17	≫Change
Catalogue names	KIC 06220497 2MASS J19443954+4133211 UCAC4 658-078826	≫Change
Variable type	*Not specified.*	≫Change
Spectral type	A9V	≫Change
Magnitude range	14.71 - 15.22	≫Change
Period	1.323167 days	≫Change
Epoch	HJD 2456204.39612	≫Change
Rise duration	23%	≫Change
Outburst year	*Not specified.*	≫Change
Supporting files	*Not specified.*	≫Change
Discoverer	Albert Einstein	≫Change
Reference	Lee, J.; et al., 2016, KIC 6220497: A New Algol-type Eclipsing Binary with Multiperiodic Pulsations 2016MNRAS.460.4220L http://adsabs.harvard.edu/abs/2016MNRAS.460.4220L	≫Change
Remarks	33 frequencies in the range 0.05 d to 1.33 d. Dominant pulsation period 0.1174051 d, second highest 0.0559060. Pulsation amplitude = 0.02 mag. Min II magnitude = 14.81 Kp.	≫Change

NOTE
- Please make certain all above details are correct before submitting this new star.
- Input will be checked for errors and an opportunity will be given to correct any.
- All submissions must be approved before appearing in the live database.
- VSX moderators reserve the right to edit submissions for accuracy and clarity.
- Your network address (98.163.106.252) and user information will be logged.
- Supporting documentation is required for all original unpublished submissions.
- Literature reference is required for all previously published submissions.
- VSX is not a guaranteed permanent repository for uploaded documents.

Cancel   Back   Subm

If any of the information is incorrect or needs to be modified in any way, select the "Change" button on the line appropriate to the item being changed. This will take you back to the initial data entry page. Make the modifications and select "Save". It will send you back to the "Review Submission" page. When satisfied select "Submit". No changes may be made once the document is submitted. After the review process by the moderators, when they have approved any changes based upon their comments, the final VSX page for the submission will look like this:

AAVSO Home

The International Variable Star Index

Search   Submit   Register   Log In   Account   About

Current Time: 27 Oct 2018 18:41:05 UTC   **Welcome, Guest. You are not logged in.**

> Log in

> Revise   > New Search

Latest Details   [?]

Log in to retrieve additional aliases from SIMBAD.

Name	☑ **KIC 6220497**
AAVSO UID	000-BMD-279 (No observations)
Constellation	Cygnus
J2000.0	19 44 39.55 +41 33 21.2 (296.16479 +41.55589)
B1950.0	19 42 59.00 +41 26 02.7
Proper motion	RA: -6.8 +/- 2.6 mas/y Dec: -3.5 +/- 1.7 mas/y Source: **UCAC4**
Galactic coord.	75.501 +8.581
Other names (Internal only)	2MASS J19443954+4133211 UCAC4 658-078826
Variability type	EA/SD+DSCT
Spectral type	A9V
Mag. range	14.71 - 15.22 Kp
Discoverer	--
Epoch	03 Oct 2012 (HJD 2456204.39612)
Outburst	--
Period	1.323167 d
Rise/eclipse dur.	23%

> Sequence

> Search nearby

(Not logged in) > **Add name**

❓ (Variability type)

❓ (Mag. range)

> **Ephemeris**

Remarks   [?]

Some references may be clicked to view in new window. Roll over index number to view submission details.

1	Hinzel, David H.	33 frequencies in the range 0.05 d to 1.33 d. Dominant pulsation period 0.1174051 d, second highest 0.0559060 d. Pulsation amplitude = 0.02 mag. Min II magnitude = 14.81 Kp.

(Not logged in) > **Add remark**

References   [?]

Click reference title/citation to view in new window. Roll over index number to view submission details.

1	Lee, J.; et al., 2016, **KIC 6220497: A New Algol-type Eclipsing Binary with Multiperiodic Pulsations**	2016MNRAS.460.4220L

External Links   [?]

Links open in a new window. Not all links may be valid for this particular target.

Location   -- Select --   ▼   > **Go**   Select a **Location** for more details.

Catalog Data   [?]

Information from selected catalogs obtained by cross-matching to 2 arc seconds using the **CDS X-Match Service**. These data may not be

complete.

2MASS	J = 13.68	H = 13.45	K = 13.41	J - K = 0.27	
AllWISE	W1 = 13.44	W2 = 13.42	W1 - W2 = 0.01		
APASS-DR9	B = 15.15	V = 14.67	g' = 14.85	r' = 14.56	i' = 14.57	B - V = 0.48

Images   [?]

Please review Digitized Sky Survey **Acknowledgment** and **Copyright**.

Size | 5' x 5' (297 x 298 pixels)
Center | 19 44 39.55 +41 33 21.2 (J2000)
Source | STScI
Survey | POSS2/UKSTU Red ▼
Red, all sky, 1.0 arcsec/pixel
✔ **Negative**

Supporting Documents   [?]

There are currently no supporting documents on file for this star.   (Not logged in) › **Add document**

Revision History   [?]

Currently approved revision is checked. Click revision number to view details of that revision.

✓ **1** **Hinzel, David H.**   2016-12-12 13:13 UTC   Initial submission.

› Guidelines   › FAQ   › Forum   › **Variability Types**   › **Passbands**   › **Copyright**   › **Acknowledgments**   › **Privacy**   › **Contact**   › Help us

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Version 1.1 [C]

Moderation process. How to modify your submission to apply the requested changes.

Clicking on the "My submissions" link will show you the name of the stars you are working on and clicking on them will in turn take you to an editing form where you will be able to make the requested changes.

To avoid sending notifications to the VSX moderators every time you make a small modification, keep the changes using the "draft only" option (check that box) and only check submit when you are done making changes.

Whenever you have to upload an improved version of a file, remember to delete the previous one. There is a delete box at the right of the file name in the editing form. Check it.

Appendix 3: Calculating Transformed V Values from CMC15 and UCAC3

CMC15 and UCAC3 can be utilized to calculate transformed V values. Search for the star to be analyzed at http://vizier.u-strasbg.fr/viz-bin/VizieR?-source=I%2F315. Both CMC15 and UCAC3 can be accessed from here. Select the appropriate catalog and then click on the form to get both the f-mag and a-mag from UCAC3 and r' mag from CMC15. The J and K variables are the Jmag and Kmag from 2MASS, also found on the CMC15 and UCAC3 pages. The formulas for the calculation are:

V from UCAC3 f-mag: (V=0.531*J-K+0.906*UCAC3 f-mag+0.95)
V from UCAC3 a-mag: (V=0.529*J-K+0.9166*UCAC3 a-mag+0.83)
V from CMC15 r'-mag: (V=0.6278*J-K+0.9947*CMC15 r'-mag)

These calculated values should match reasonably well.

Appendix 4: AAVSO Observing Sections

One of the most challenging tasks in submitting to VSX is determining the type or class of star. AAVSO has observing sections that focus on specific classes of stars. Below is listed those speciality sections. Each section has detailed information about stars in each class, including a "Target List" of objects in the class. This target list contains, among other things, a clickable "variable type" link that goes directly to the "Variable Star Type Designations in VSX" which gives detailed information on the various classes and subclasses of stars that are submitted to VSX. Clicking on any target listed in the target list directs you to the appropriate AAVSO VSX page for that star. From there, all of the information for that star is available including light curves. Hopefully this will aid in the determination of star classes and subclasses for VSX submission.

https://www.aavso.org/cataclysmic-variables

https://www.aavso.org/aavso-eclipsing-binary-section

https://www.aavso.org/aavso-short-period-pulsator-section

https://www.aavso.org/aavso-long-period-variable-section

https://www.aavso.org/aavso-young-stellar-objects-section

https://www.aavso.org/aavso-international-high-energy-network

https://www.aavso.org/exoplanet-section