Helping the VSX Team

Basically, what we need is people able to submit updates with information published in recent (or not so recent) papers or websites.

It requires some knowledge about catalogues and its vagaries (you'll learn that in the process) but at the same time there are data sources that are very easy to handle and only require getting used to them. Once you know the format needed to enter the data and what is relevant or not to VSX, it becomes part of a daily routine.
Some of the sources only publish once a month or weekly so that wouldn't be a problem.

Depending on your available time, you can **1)** "**Adopt a journal**" (checking for updates from that journal and submitting the corresponding revisions, this would be the less time-consuming project); **2) check for astro-ph updates** (multiple sources, lots of papers, but that task could be split into several volunteers) or **3)** help with the **list preparation process** (cleaning up published lists of variable stars and properly formatting them for VSX upload, more complex but very important!).

What you need to know is what to write in the different VSX fields when you are making a revision from a literature/web source.
Once you know what to do with a specific source, you'll always use the same reference format, etc. The revision comment will be the same. And so on and so forth, so it will become a routine.

If we get several volunteers we can assign a data source to each of them.

VSX updates – Online spreadsheet

We work with an online spreadsheet to write down the changes as they are made so everybody involved knows what is done and what is not.

https://docs.google.com/spreadsheets/d/1Q2x8oZGf-wvRzm166l_VJ3_Rd4na056-EQ3sNsWUeyY/edit#gid=0

When you make an update you write down the date when you submitted a revision/submission from a specific source and your observer code so everybody knows that it has already been checked.

We have two sheets, the **Update** sheet is for journals and webpages:

- The red items are alert pages (we are already taking care of those)
- The black items are journals (some are already being checked)
- The pink items are webpages and bulletins (some are already being checked)

This is the description of the three basic projects for which we may use your help:

1) <u>Adopt a journal</u>

You can take over one of the items above and start checking for updates from that specific source.

An example: go to the spreadsheet and you will find that we are one year behind with the IBVS and with the OEJV. So you can adopt one of those journals and be the one who will be in charge of doing updates from their publications.

Below some tips that will help you no matter which of the three projects you choose.

The VSX Process

So, you look for relevant information and once you find it, you submit a revision (clicking on the Revise button on the star's page) or a new submission if the object is not in VSX.

In the case of revisions, a revision form will come up and you will be able to revise the information in that form with the new numbers you find in the paper.

Then you have to fill the Reference fields properly to know where the information came from. Paper trail is important in VSX.

To know more about how the VSX process works, please read our guidelines here:

https://www.aavso.org/vsx/index.php?view=about.notice

Selecting the information

You have to search the paper for information on known or new variable stars.

We focus on the optical range and show the visual range if it is available.

We don't include variables that do not vary in the optical. The subgroup of X-ray variables in VSX are there because they also vary in optical wavelengths.

We also have limitations for the extragalactic stuff, we only include blazars, QSOs, SNe and other extragalactic sources if they are brighter than mag. 15 or so. We are also adding some objects on an individual basis if some observer is planning to observe them or if we launch a campaign. We can't add them all because it would become an endless task. And most of the objects are very faint and won't be observed from the ground.

Our goal is to show updated information on the type and range of variability displayed by the catalogued stars.

So, if we are talking about a new variable and it doesn't have a V range, e.g., only Rc data, you add the Rc range. But you don't replace the V range by a Rc range in the case of a known variable. You replace data when you see the new data are better, or supersedes what we have.

E.g. we have a range V= 11.40 - 11.87 for a semiregular variable and the published paper reported it varying between 11.24 and 11.80. You don't replace 11.40 - 11.87 by 11.24 - 11.80. You only update the maximum magnitude, which now has proven to be brighter at times (= new range 11.24 - 11.87).

A different thing is when you find a systematic problem or some mistake in an old range in the case of strictly periodic variables.

E.g., an EB which varies between 11.10 and 11.55 and whose old range was 11.25 - 11.70. You check some independent sources (e.g.: ASAS-3, APASS, UCAC3, CMC15 - we can talk about this by e-mail, we can provide spreadsheets for photometric transformations and analysis when needed -) to see which one is right and adopt the correct range.

Those were just a couple of examples to show that revisions should only be made to improve what we already have and that we don't delete V info.
We are incorporating data published in the literature so the most important thing to do is selecting data that will improve the current information.

If the stars are new discoveries, well, we may eventually add them and if there is a mistake we can blame the authors (!), but when revising known variables, we may be overwriting good information with incorrect data. So if what we already have looks good, it is better not to touch it.

E.g. if we have data collected over several years and from different sources and the new info comes only from a single project with a more limited time span, the "old" numbers will surely be better. Thus, you don't update the periods. If there is a good epoch you can add it.

Usually, a couple of checkings are enough to know if a paper has good quality or not (especially when we are handling lists of variable stars, see below).

So this is the most difficult part: being able to judge what is wrong or what is acceptable. We can't check everything but we can't take everything at face value. We need to compromise.

If the data have been revised recently by VSX-administrator or some of us (Patrick, Sebastian), only make an update when you're sure there is something new that justifies a revision, if not it will be duplicate effort (again, any doubt we can discuss it by e-mail)

2) Lists

The second sheet in our spreadsheet is called **Lists**. When a publication includes more than 4 or 5 variables, it becomes easier to treat them as a list because revising/adding the stars one by one would take longer. "Treating them as a list" means that an Excel table can be prepared including all the information.
Separate the data in columns.

Required information

The basic information should be:

Star ID, RA (J2000.0), DEC (J2000.0), Other names (separated with commas and with no spaces), Type, Period, Epoch, Max. magnitude, Max. passband, Min. magnitude, Min. passband (an amplitude can be given in the minimum magnitude field, but if that is the case, change the column's name).

If you have more information, like spectral type, discoverer, etc., add a column to include them.

You can also add a remarks column.

Finally, the reference name (Author(s), year, paper title or journal issue), reference bibcode (e.g. 2016ATel.9063....1B) and reference URL (link to the ADS abstract).

Cross-identifications

The first thing to do with a list is separating the known stuff from the new one (we upload them separately).

The source may include cross-identifications but that is not enough. You'd be surprised to know how many variable stars claimed to be new discoveries are actually already known.

You can use **VizieR** to cross-identify the objects in the list with VSX records.

A weekly version of VSX is hosted there:

http://vizier.u-strasbg.fr/viz-bin/VizieR-3?-source=B/vsx/vsx

Click on the **List of targets** tab.

Then upload a text file with RA and DEC obtained from the paper.

Always search by positions not identifiers. Any positional search will reveal objects that may have been entered to VSX with another name.

Use a search radius of 30" in order to get as many results as possible and to account for poor positions. In the case of faint stars or crowded fields use a 10" radius.

Then double check in case there are more than one VSX entry around that position. It might be a duplicate entry (let us know) or a nearby bona-fide variable.

Use the VSX name you get from VizieR as the primary name in your table.

For new stars, the primary name should be the one given in the publication.

Other improvements

We also need to improve the stars' positional data so we again use the List of targets option in VizieR but this time with the UCAC4 or PPMXL catalogues (or 2MASS in the case of faint red stars). This is valid both for known and new objects. If there is more than one star in the astrometric catalogues, try to properly identify the variable based on its magnitude and colors (don't worry, send us an e-mail and we will discuss how to handle these situations).

Some checkings on period and variability type should be made too.

E.g.: if you find RRAB stars with periods of 0.05 d., they will surely be HADS not RRAB so you should correct the type (only the evident mistakes, we can't check one by one, the lists are supposed to have been reviewed…)

Once the table is ready, you send us the list by e-mail and Patrick Wils will upload it so the information is added to the VSX database.

3) Astro-ph

The most difficult task is handling **astro-ph**. Those are papers on variable stars published in non-specialized journals so you need to dig in and find the relevant info.

A lot of publications to check, and we are now months behind and we also have papers from past years to review (astro-ph is completed until March 2014 and then from September 9, 2015 to March 23, 2016).

To get the list for a month, you can use an URL like this (for December 2015):

http://arxiv.org/list/astro-ph/1512

1213 papers...
But fortunately we have this blog:

https://veraenderlichesterne.wordpress.com/

where you daily get a list of the astro-ph publications including variable stars.
It is compiled by Andreas Barchfeld from the BAV. Subscribe to that blog to get the list of relevant papers.
Even all those papers may have nothing at all to use in VSX (e.g. theoretical papers) but need to be checked.

For example, if you want to check the papers from July 2015, you go to the July archive:

https://veraenderlichesterne.wordpress.com/2015/07/

and check the July papers starting from July 31 and going backwards (that's how we plan to do the updates of the old stuff).

When you find data on variable stars that could be of use, you submit a revision/submission.

A lot of questions will surely arise when you start working so the best way to learn is to actually do it ;). We'll help you out in the process.

Your work will be documented in line 30 of our spreadsheet: "Astro-ph - PAST issues".

E.g.: you start with July 31 so you write that date in the "Update" column.

As you go backwards change the date in the "Last issue" column (e.g.: 2015 July 29)

As you move forward, change the date in the "Update" column.

Add your observer code in the "Updater" column.

As mentioned above, one of the most difficult aspects of the task is to make a judgement on what is worth and what is not regarding the updates.
Not everything is useful. If the presented observations are sparse and there are data in VSX from a survey covering a longer time span, you don't update the periods. If there is a good epoch you can add it.

Only make an update when you're sure there is something new that justifies a revision.

Some training to deal with these issues would be recommended when the star is already in VSX. New stars will be easier.

References

Some tips to give proper references when checking astro-ph:

Near the bottom of the right pannel in the paper's URL, you have a link: "**References & Citations NASA ADS**", this will take you to the ADS info on each of the astro-ph papers.

An example. Go to:

http://arxiv.org/abs/1512.00016

The NASA ADS link will take you to:

http://adsabs.harvard.edu/cgi-bin/bib_query?arXiv:1512.00016

Click on the bibcode given there to make the final URL/citation for VSX use:

http://adsabs.harvard.edu/abs/2015ApJ...815L..31R

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