

AAVSO's ZAPPER

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Zapper Help

Zapper is an easy-to-use tool designed to allow AAVSO website users to help the HQ staff with data validation. Zapper is run via Java Web Start so that it will always be up-to-date. It will check to see if you have the current version when you run it, and if it's not current, the program will download the newer version from AAVSO HQ. Should you experience any problems opening the program from the .jnlp file downloaded to your computer on a previous occasion, please return to the AAVSO website and download it again (the .jnlp file itself may have changed).

Users can call up data on any star in the AID by name, designation, or AUID. Any JD range can be specified but the plot will only display the most recent 20,000 data points (for speed and space limitations on individual machines). Please note that un-reduced step-magnitude observations (denoted by mtype = 2) and raw differential magnitude observations (mtype = 1) will not be displayed at all.

When the program begins it will present a dialog box asking you to enter in a star's name and the requested date range in JD format. Once entered, it will look for observational data on that particular star and then present its light curve for you.

The Zapper Screen

The Zapper Screen is divided into four parts.

- *Legend Box*: This area specifies the colors the data takes in the main screen. These colors are user definable.
- *Main Screen*: This Main Screen area is where your star's light curve will show up. Using your mouse you'll be able to manipulate the curve, get data on individual points, and mark data to send to AAVSO HQ.
- *Command Buttons*: This area gives you the Zapper's main commands and data manipulation features.
- *Data Details*: As you click on various data points in the Main Screen the Data Details area will show information from that particular observation. Pausing your mouse cursor over these fields will tell you what they are.

Let's look at these areas individually.

The Zapper Legend Box

This box labels all the different types of data points you'll see in the light curves displayed on the Main Screen. The colors displayed are user-definable by going to the menu Options->Preferences->Customize Colors.

- *Vis.*: Observations made with naked eyes, binoculars, or telescopes at the eyepiece.
- *V*: Johnson V filter.
- *B*: Johnson B filter.
- *R*: Cousins R filter.
- *I*: Cousins I filter.
- *U*: Johnson U filter.
- *RJ*: Johnson R filter.
- *IJ*: Johnson I filter.
- *H*: H NIR 1.6 micron filter.
- *J*: J NIR 1.2 micron filter.
- *K*: K NIR 2.2 micron filter.
- *SZ*: Sloan z filter.
- *SU*: Sloan u filter.
- *SG*: Sloan g filter.
- *SR*: Sloan r filter.
- *SI*: Sloan i filter.
- *STU*: Stromgren u filter.
- *STV*: Stromgren v filter.
- *STB*: Stromgren b filter.
- *STY*: Stromgren y filter.
- *STHBW*: Stromgren Hbw filter.
- *STHBN*: Stromgren Hbn filter.
- *TB*: Tri-Color Blue filter.
- *TG*: Tri-Color Green filter.
- *TR*: Tri-Color Red filter.
- *MA*: Optec Wing A filter.
- *MB*: Optec Wing B filter.
- *MI*: Optec Wing C filter.
- *CV*: Unfiltered with V Zeropoint.
- *CR*: Unfiltered with Red Zeropoint.
- *Orange*: Visual orange filter.
- *Blue-vis.*: Visual blue filter.
- *Green-vis.*: Visual green filter.
- *Red-vis.*: Visual red filter.
- *Yellow-vis.*: Visual yellow filter.
- *N/A*: CCD observations made using a non-standard filter or no filter at all.
- *fainter-than*: A data point indicating that the actual star was not detected and is assumed to be of a magnitude fainter than that displayed. Fainter-than points are displayed using a downward-pointing triangle symbol.

- *discrepant*: A discrepant point is a data point that you decide is problematic or questionable and should be investigated by the HQ staff. Discrepant observations are displayed using an "X" symbol.
- *show observer*: lines are drawn between points that a particular observer has contributed to the displayed data set.

The Zapper Main Screen

The Main Screen will display the data points in the light curve for the star you have selected. You'll see the data points displayed in the colors you've selected as per the Zapper Legend Box. The X-axis for the Zapper Main Screen denotes the date displayed in JD format. The Y-axis shows the magnitude.

Clicking and dragging from the upper-left-hand corner to the lower-right-hand corner will allow you to select a portion of the light curve to "zoom in on."

Left-clicking on any individual data point will allow you to display data on that point in the Data Details area. After a point is selected, crosshairs will come up to allow you to better see the selected data point.

Right-clicking on any individual point will bring up a dialog box indicating that the point selected will be sent to AAVSO HQ for validation. You may also add comments if you wish. Please restrict yourself to using simple alphanumeric characters. Characters such as semicolons, quotes, apostrophes, parentheses, percent signs, sharps, and at-signs are not allowed.

The Zapper Command Buttons

The Zapper Command Buttons allow you to manipulate your light curve display, get additional data on specific data points, and make comments on these data points to the AAVSO HQ staff for validation purposes.

- *Zoom Out*: If you have selected a portion of the light curve to zoom in on in the Zapper Main Display, this command will zoom you back out one level. Multiple button pushes will zoom you out additional levels until you reach your original light curve display.
- *Back*: Button will pan the Main Display backward in time along the X-axis.
- *Forward*: Button will pan the Main Display forward in time along the X-axis.
- *Next Star*: Button will bring up the Star Selection Dialog Box and allow you to select an entirely new star's light curve for viewing.
- *Connect My Obs*: Button will visually string together any data points in the displayed light curve that are yours.
- *Connect Observer*: Button will string together any data points in the light curve made by the observer whose data point is selected in the Main Display.
- *Disconnect*: Button will clear strung together observations from the same observer.
- *QUIT*: Quit the program.

The Data Details Area

This area will show the full data on the observational data point you've selected. Depending on the data stored regarding the observation, not all the fields will be filled in. If you hover your mouse cursor over a particular field its label will be revealed.

The fields are:

- *Harvard Designation*
- *Star Name*
- *Julian Date of Observation*
- *Fainter Than*: A "<" symbol will display here if star is actually fainter than the reported magnitude.
- *Magnitude of Observation*
- *Uncertain*: A ":" will display here if the reported magnitude is uncertain.
- *Comment Code*
- *Observational Type*: Visual, CCD, PEP, etc.
- *Band*: CCD filter used in observation.
- *Uncertainty*: Error bar for CCD observation.
- *Data Status*: Validated, Unvalidated, etc.
- *Other Fields*: This text area is a catch-all for other data collected on an observation - comments, comp stars used, charts used, etc.

The Main Display Cursor Details Area

This area will display data about the area of the display your mouse cursor is currently over. It does not necessarily display data on specific observational points. By moving your cursor around the Main Data Display you'll see these fields change depending on where the cursor is.

The fields are:

- *Calendar Date*
- *JD*: Date in Julian Date format.
- *Magnitude*: The magnitude a data point would have if it was here.
- *# of records in your selected light curve*

The Program Menu

Although most of the features of Zapper are handled in the Command Buttons Area, there are a few menu options. They are:

- *Options->Preferences->Customize Colors*: This menu item brings up a dialog box enabling you to individually customize the color of the data points in the Main Display. You can change colors, preview the color changes to see if you like them, and then save them for future displays. The LCG button will make the colors the same as the online

Light Curve Generator. Default colors will return the colors to the default Zapper color scheme.

- *Options->Preferences->Change Dot Size->Make Dots Bigger*
- *Options->Preferences->Change Dot Size->Make Dots Smaller*
- *Options->Preferences->Show/Hide Connecting Lines*: This preference is a toggle that will enable you to either show or hide the connecting lines that string together a single observer's observations in the light curve.
- *Options->Preferences->Show/Hide Legend*: This preference is a toggle that will show or hide the Legend Box. If the Legend Box is hidden, the Main Display becomes bigger.
- *Options->Print Plot*
- *Options->Save Plot*
- *Help->Online Help*: This Help File.
- *About Zapper*: Gives version number and contact information.

Your selected settings will be saved in a file called `zapperDefault.ini` which will reside in `C:\Windows\` if you have a PC, or in your Documents folder if you are using MacOS X.

A file called `zapperlog.fil` will appear in `C:\Windows\` if you are using a PC, or your Documents folder if you are using MacOS X.. It is hoped that this file will come in handy for troubleshooting purposes if I wish to try to recreate a failure scenario. You may delete this file periodically if it becomes too large.

Data Evaluation Help

The main purpose of Zapper is to allow you the opportunity to help HQ staff with data validation by providing an easy-to-use tool for marking questionable observations. All observations you mark will then be inspected by HQ staff who will judge whether the observation is discrepant or not and mark it accordingly. In some cases, HQ will also contact the observer to have him or her check original reports for transcription errors. Below, please find some general guidelines and techniques which you should follow as you evaluate data.

For more information on data evaluation you may wish to read the following article, "The AAVSO Data Validation Project", JAAVSO, vol. 34, no. 2, p. 238-250 at <http://www.aavso.org/publications/ejaavso/v34n2/238.shtml> .

AAVSO Data Evaluation Guidelines

The following observations could be considered "suspicious" data worthy of marking:

- Positive observations more than 1 magnitude brighter or fainter than the mean magnitude. Make sure you are comparing observations made using the same color filter with each other (don't try to compare a CCDB observation with a visual one, for instance). Also, make sure you are comparing observations made at approximately the same time (for some stars, significant changes in behavior can occur in a very short time.)
- Fainter-than observations that are fainter than the mean curve.

- Observations made during the "seasonal gap" of a star.
- For novae and supernovae, positive observations made before outburst.

Data Evaluation Techniques

No doubt, you will soon develop your own data evaluation techniques, but here are some that we have found useful:

- Request a large range of data initially, then zoom in and pan forward or backwards in time. Often, it is easiest to start at the most-well-observed end and work toward the less-well-observed end of a light curve (But be careful! The behavior of a star may change over time).
- When you zoom in, do so by selecting a vertically-long thin box that extends from above the brightest point of the light curve to below the faintest. That way, you will not miss any observations as you pan forward or backward in time.
- Before zooming out, it is often helpful to save your spot on the light curve by left-clicking on a point in your zoom window first. By doing that, you can see where you left off so you can zoom back in to approximately the same location if desired.
- When you find a discrepant observation, try connecting that observer's observations together. This may give you some idea of trends. Also, if you see an absolutely vertical line going from the discrepant observation to another observation at the exact same time, it usually indicates that the observer corrected the observation but did not delete the discrepant one. Please mark the discrepant observation.
- If no data appears when you request a star known to have AAVSO data, or the plot seems to be cut off horizontally or vertically, there could be a problem with the data (such as a comma instead of a decimal point in the JD or a colon in the magnitude field). In these cases, please send an email to aavso@aavso.org describing the situation as best you can, including the name of the star and the problem JD range. Also, use of the word "Zapper" in the subject line will direct your email to the right staff member more quickly.
- If you see a star which contains many suspicious data points that seem to follow a pattern, it is not necessary for you to mark all of them. Simply marking a few observations will be sufficient to attract the attention of Headquarters staff who always validate observations in the context of the larger data set.

Thank you for your help!