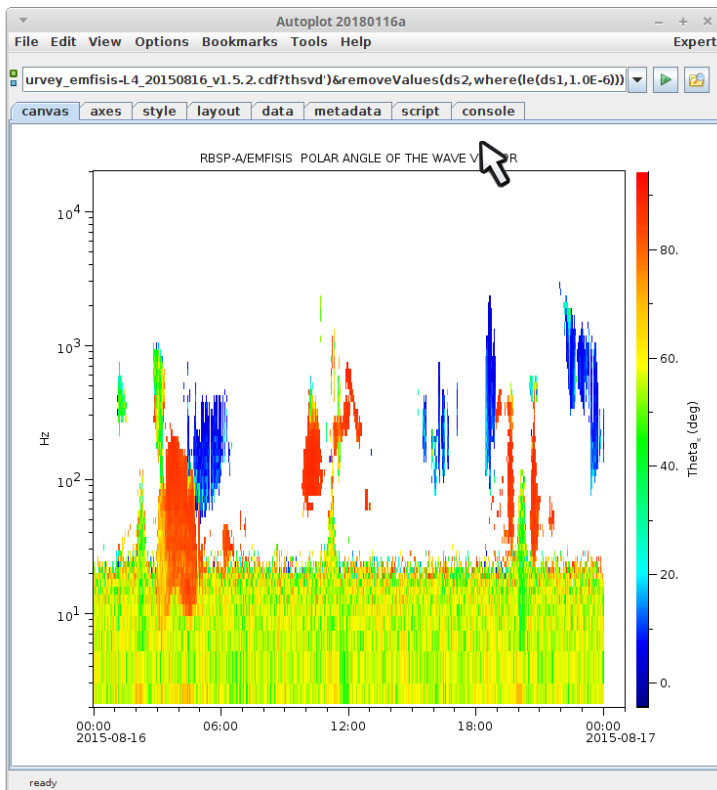
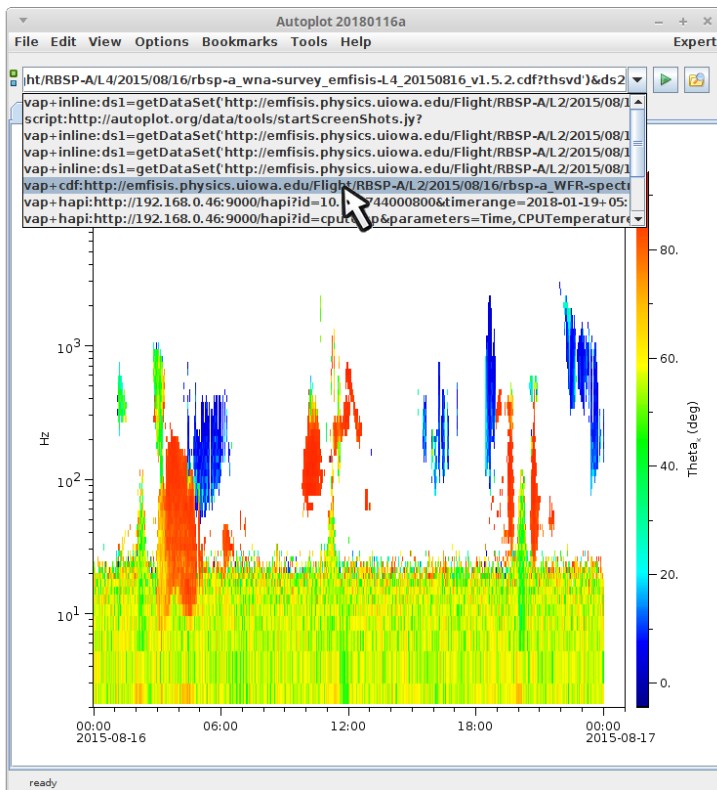


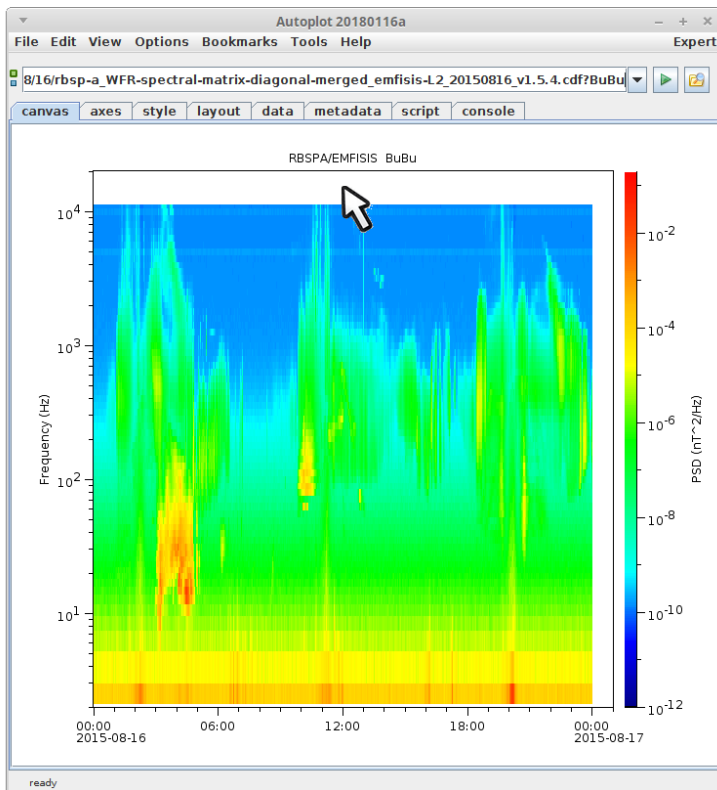
1. Our goal is to use the Data Mash-Up tool to use one data set to filter another.



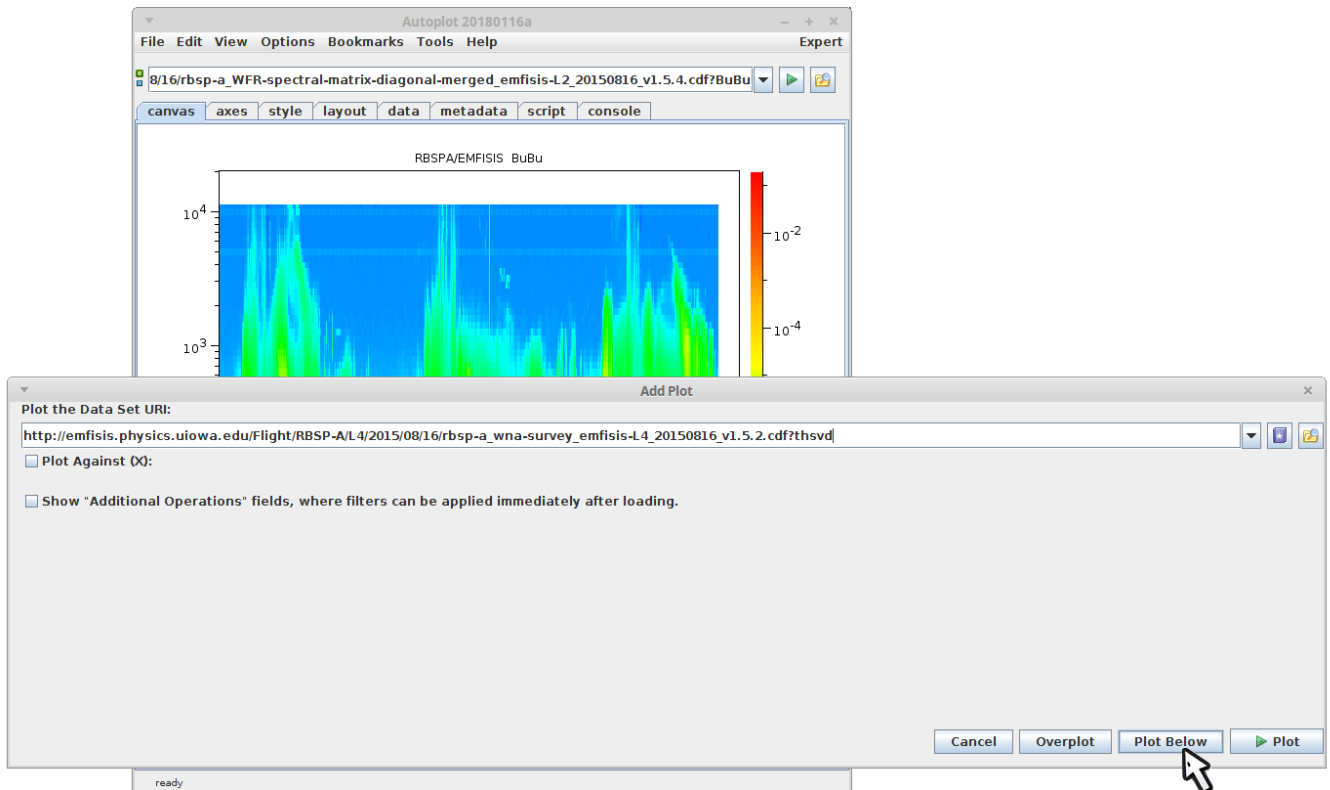
## 2. First we'll plot BuBu.



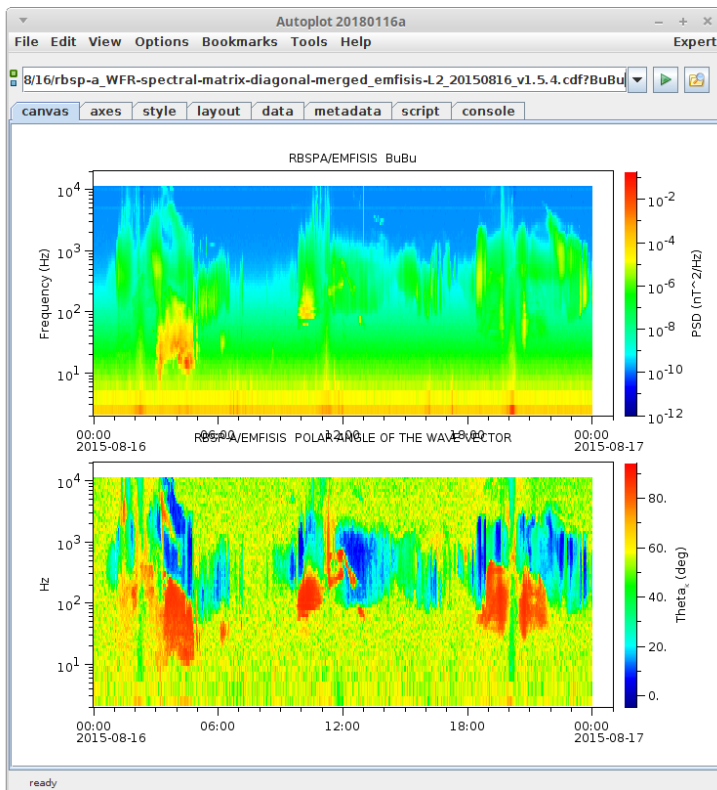
### 3. First we'll plot BuBu.



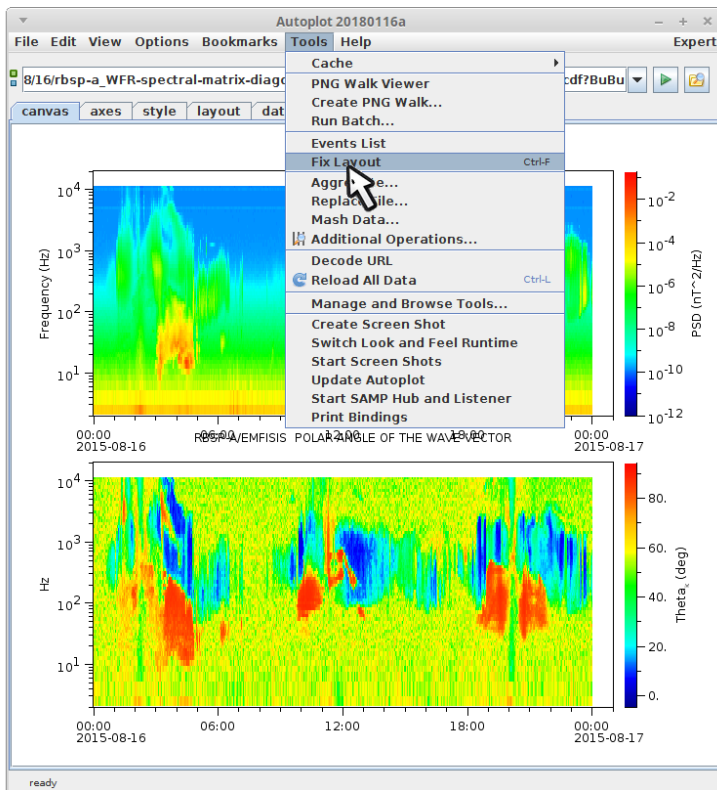
4. Then we'll plot thsvd below. Note this is from the same instrument and spacecraft, but the data resides in a different file.



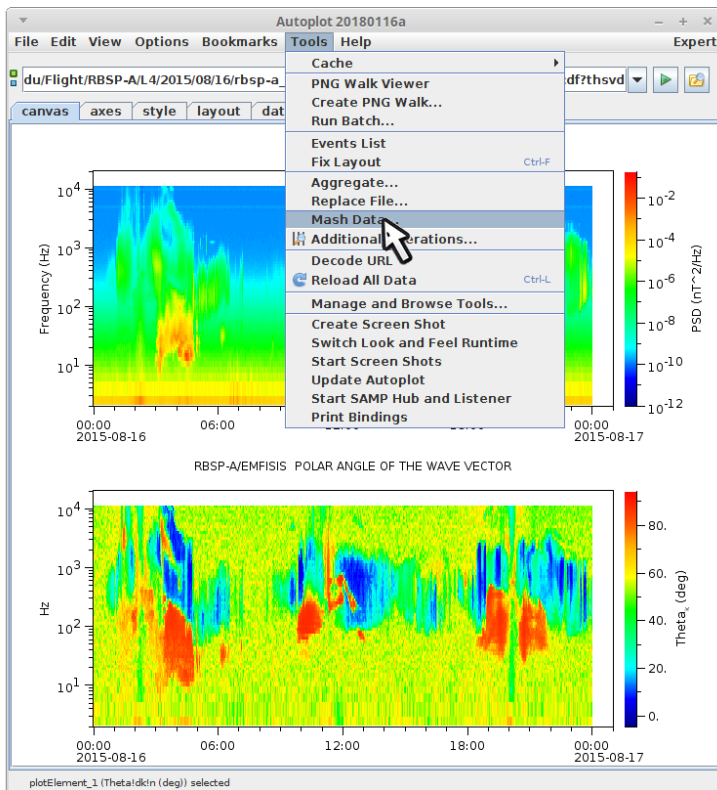
5. Both are plotted. We'll use BuBu to filter thsvd.



6. (Note fix layout can be used to fix overlapping labels.)



7. With the focus still set on the bottom plot, select "Tools->Mash Data" from the menubar.



8. This is the Mash Up tool. We load in some number of parameters at the top, and then create a tree of data operations to get the data we want.

The image shows two overlapping windows from the Autoplot 20180116a application. The top window, titled "Autoplot 20180116a", displays a plot of "RBSPA/EMFISIS BuBu" data. The plot area shows a horizontal bar with a red vertical line at the end, and the y-axis is labeled with  $10^4$ . The bottom window is the "Mash Up" tool, titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')". It features a "Load these Data Sets into variable names:" section with a text input field containing the URL and a "(click to add)" button. Below this is a "Drag functions onto the palette to the right:" section with a list of mathematical functions: `add(x,y)`, `subtract(x,y)`, `multiply(x,y)`, `divide(x,y)`, `pow(x,y)`, `log10(x)`, `sqrt(x)`, `abs(x): the absolute value of the data`, `magnitude(x): the lengths of the vectors`, `toRadians(x)`, `toDegrees(x)`, `sin(x)`, `cos(x)`, `tan(x)`, `asin(x)`, `acos(x)`, and `atan2(y,x)`. To the right of this list is a "Double-click on the name to set the variable or constant argument:" section with a list containing "ds1". The bottom right of the dialog has buttons for "Cancel", "Overplot", "Plot Below", and "Plot".



9. Rename the first variable "thsvd". This is basically a variable name we use to refer to the data.

The image shows a multi-step software workflow. At the top, a window titled "Autoplot 20180116a" displays a plot of "RBSPA/EMFISIS BuBu" data. Below it, a "data" window is open, showing a list of data sets with the URI "http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd". A "Rename parameter and dataset editor" dialog is active, showing a list of CDF variables. The variable "thsvd" is selected. The dialog also shows advanced options for loading a subset of data and interpreting metadata. A mouse cursor is pointing at the "thsvd" variable in the list.

Autoplot 20180116a

File Edit View Options Bookmarks Tools Help Expert

u/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd

canvas axes style layout data metadata script console

RBSPA/EMFISIS BuBu

10<sup>4</sup>

Editing URI vsp+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')

data jython mash up

Load these Data Sets into variable names: Time Range:

ds= http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd

(click to add)

synchronize data by time tags, interpolating data to the first dataset's time tags

Drag functions onto the p

mathematics dataset

Parameter name: thsvd

Select CDF Variable (of 19) X Y

- esum
- esumperp
- phpoy1\_2\_3
- phsvd
- plansvd
- plansvde
- polsvd
- poy1\_2\_3
- thpoy1\_2\_3
- thsvd

Advanced

Load subset of the data:

Only load data where:

WFR frequencies

Interpret Metadata:

no ISTP  no dependencies

show all (8 support not shown)

thsvd(Epoch=14399,WFR\_frequencies=65)

POLAR ANGLE OF THE WAVE VECTOR

Wave Normal Angles are determined using the SVD method

Cancel Okay

Plot

10. We get BuBu from the history of URIs we've plotted.

The image shows two overlapping windows from the Autoplot software. The top window, titled "Autoplot 20180116a", displays a plot of "RBSPA/EMFISIS BuBu" with a y-axis labeled  $10^4$ . The bottom window, titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')", is in the "data" tab and shows a list of data sets. The first entry is "thsvd=" with the URI "http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd". The second entry is "ds1=" with the URI "vap+ cdf:http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\_WFR-spectral-matrix-diagonal-merged\_emfisis-L2\_20150816\_v1.5.4.cdf?BuBu". A mouse cursor is pointing at a plus icon next to "ds1=", and the text "(click to add)" is visible below it. Below the data list is a checkbox for "synchronize data by time tags, interpolating data to the first dataset's time tags". At the bottom of the window is a "mathematics" palette with various functions like "add(x,y)", "subtract(x,y)", "multiply(x,y)", "divide(x,y)", "pow(x,y)", "log10(x)", "sqrt(x)", "abs(x)", "magnitude(x)", "toRadians(x)", "toDegrees(x)", "sin(x)", "cos(x)", "tan(x)", "asin(x)", "acos(x)", and "atan2(x,y)".

# 1. Let's rename it to BuBu.

The image shows a screenshot of the Autoplot software interface. At the top, a window titled "Autoplot 20180116a" displays a plot of "RBSPA/EMFISIS BuBu" data. Below the plot, a "Rename parameter and dataset editor" dialog box is open. The dialog box has a "parameter name" field containing "BuBu". It features a "Select CDF Variable (of 8)" list with options: BuBu, BvBv, BwBw, EuEu, EvEv, EwEw, TotalPowerB, and TotalPowerE. The "Advanced" section includes a "Load subset of the data:" dropdown, a "Only load data where:" field with "BuBu" and ">= 0", and "Interpret Metadata:" options for "no ISTP" and "no dependencies". The "show all (10 support not shown)" checkbox is also present. At the bottom of the dialog, the text "BuBu(Epoch=14399, WFR\_frequencies=65)" and "CDF data type is CDF\_REAL4" is visible. A mouse cursor is pointing at the "Okay" button.

12. To build the tree, first we'll grab the function "removeValues", from under the filters tab.

The image shows two overlapping windows from the Autoplot 20180116a application. The top window displays a plot titled "RBSPA/EMFISIS BuBu" with a y-axis scale of  $10^4$ . The bottom window is titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')".

The bottom window contains the following elements:

- Load these Data Sets into variable names:** A table with two rows:

thsvd=	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd
BuBu=	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu
- synchronize data by time tags, interpolating data to the first dataset's time tags
- Drag functions onto the palette to the right.** A list of functions under the "filters" tab:
  - add(x,y)
  - subtract(x,y)
  - multiply(x,y)
  - divide(x,y)
  - pow(x,y)
  - log10(x)
  - sqrt(x)
  - abs(x): the absolute value of the data
  - magnitude(x): the lengths of the vectors
  - toRadians(x)
  - toDegrees(x)
  - sin(x)
  - cos(x)
  - tan(x)
  - asin(x)
  - acos(x)
  - atan2(y,x)
- Double-click on the name to set the variable or constant argument.** A list containing "ds1".
- Buttons at the bottom: Cancel, Overplot, Plot Below, Plot.

13. Drag "removeValues" over to the palette on the right.

The image shows two overlapping windows from the Autoplot 20180116a application. The top window displays a plot titled "RBSPA/EMFISIS BuBu" with a y-axis labeled  $10^4$ . The bottom window is titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')". It features a "Load these Data Sets into variable names:" section with two entries: "thsvd=" pointing to a URL and "BuBu=" pointing to another URL. Below this is a "Drag functions onto the palette to the right." section with tabs for "mathematics", "dataset", "filters", "my functions", and "all". The "mathematics" tab is active, showing a list of functions including "putValues(ds,w,v)", "removeValues(ds,w)", "removeValuesGreaterThan(ds,v)", "removeValuesLessThan(ds,v)", and various comparison operators like "lt", "le", "gt", "ge", "eq", "ne", "or", and "and". To the right of this list is a palette area with a tree structure containing "removeValues", "ds", and "w". A mouse cursor is positioned over the "removeValues" function in the palette. At the bottom of the window are buttons for "Cancel", "Overplot", "Plot Below", and "Plot".

14. Double-click on the first argument, "ds", to select it.

The image shows two overlapping windows from the Autoplot 20180116a application. The top window, titled "Autoplot 20180116a", displays a plot of "RBSPA/EMFISIS BuBu" data. The plot shows a horizontal bar with a color gradient from blue to red, and a vertical red line on the right side. The x-axis has a label "10<sup>4</sup>". The bottom window, titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')", is used for configuring data sets. It includes a "Load these Data Sets into variable names:" section with two entries: "thsvd=" pointing to a URL and "BuBu=" pointing to another URL. Below this is a "Drag functions onto the palette to the right." section with a list of functions under the "mathematics" tab, including "putValues(ds,w,v)", "removeValues(ds,w)", "removeValuesGreaterThan(ds,v)", "removeValuesLessThan(ds,v)", "where(c)", "lt(ds1,ds2)", "le(ds1,ds2)", "gt(ds1,ds2)", "ge(ds1,ds2)", "eq(ds1,ds2)", "ne(ds1,ds2)", "or(ds1,ds2)", and "and(ds1,ds2)". To the right of this list is a "Double-click on the name to set the variable or constant argument." section with a tree view showing "removeValues" expanded to show "ds" and "w". A mouse cursor is double-clicking on the "ds" node.

# 15. Select thsvd.

The image shows a screenshot of the Autoplot 20180116a software interface. The main window displays a plot titled "RBSPA/EMFISIS BuBu" with a y-axis scale of  $10^4$ . Below the plot, there is a "Load these Data Sets into variable names:" section. Two data sets are listed:

- thsvd=** [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\\_wna-survey\\_emfisis-L4\\_20150816\\_v1.5.2.cdf?thsvd](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd)
- BuBu=** [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\\_WFR-spectral-matrix-diagonal-merged\\_emfisis-L2\\_20150816\\_v1.5.4.cdf?BuBu](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu)

Below this section, there is a "Drag functions onto the palette to the right." area with a list of functions under the "mathematics" tab:

- putValues(ds,w,v)
- removeValues(ds,w)
- removeValuesGreaterThan(ds,v)
- removeValuesLessThan(ds,v)
- where(c)
- lt(ds1,ds2)
- le(ds1,ds2)
- gt(ds1,ds2)
- ge(ds1,ds2)
- eq(ds1,ds2)
- ne(ds1,ds2)
- or(ds1,ds2)
- and(ds1,ds2)

A "Select Variable" dialog box is open, showing the following options:

- thsvd** [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\\_wna-survey\\_emfisis-L4\\_20150816\\_v1.5.2...](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2...)
- BuBu [vap + cdf: http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\\_WFR-spectral-matrix-diagonal-...](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-...)
- Liter: 0.0
- Expression:

Buttons at the bottom of the dialog include "Cancel", "Okay", "Overplot", "Plot Below", and "Plot".

16. For the second argument, we'll add a "where" which is the set of indices where a condition is true.

The image shows two overlapping windows from the Autoplot 20180116a application. The top window displays a plot titled "RBSPA/EMFISIS BuBu" with a y-axis labeled  $10^4$ . The bottom window is the "Editing URI" dialog, titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')".

The "Editing URI" dialog has a "data" tab and a "Load these Data Sets into variable names:" section. It contains two entries:

Variable Name	URI
thsvd=	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd
BuBu=	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu

Below this section is a checkbox labeled "synchronize data by time tags, interpolating data to the first dataset's time tags".

The dialog also features a "Drag functions onto the palette to the right." section with tabs for "mathematics", "dataset", "filters", "my functions", and "all". The "filters" tab is active, showing a list of functions:

- putValues(ds,w,v)
- removeValues(ds,w)
- removeValuesGreaterThan(ds,v)
- removeValuesLessThan(ds,v)
- where(c)
- lt(ds1,ds2)
- le(ds1,ds2)
- gt(ds1,ds2)
- ge(ds1,ds2)
- eq(ds1,ds2)
- ne(ds1,ds2)
- or(ds1,ds2)
- and(ds1,ds2)

On the right side of the dialog, there is a "Double-click on the name to set the variable or constant argument." section. It contains a list of variables: "removeValues", "thsvd", and "where". A mouse cursor is hovering over the "where" variable.

At the bottom of the dialog are four buttons: "Cancel", "Overplot", "Plot Below", and "Plot".



17. Drag "le" to the w argument of where...

The image shows two overlapping windows from the Autoplot 20180116a application. The top window displays a plot titled "RBSPA/EMFISIS BuBu" with a y-axis scale of  $10^4$ . The bottom window is titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')".

The bottom window contains the following configuration options:

- Time Range: [dropdown]
- thsvd= [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\\_wna-survey\\_emfisis-L4\\_20150816\\_v1.5.2.cdf?thsvd](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd)
- BuBu= [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\\_WFR-spectral-matrix-diagonal-merged\\_emfisis-L2\\_20150816\\_v1.5.4.cdf?BuBu](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu)
- synchronize data by time tags, interpolating data to the first dataset's time tags

The "filters" tab is active, showing a list of functions on the left and a palette on the right. The "le" function is highlighted in the palette, and a mouse cursor is pointing at it.

Functions listed on the left:

- putValues(ds,w,v)
- removeValues(ds,w)
- removeValuesGreaterThan(ds,v)
- removeValuesLessThan(ds,v)
- where(c)
- lt(ds1,ds2)
- le(ds1,ds2)
- gt(ds1,ds2)
- ge(ds1,ds2)
- eq(ds1,ds2)
- ne(ds1,ds2)
- or(ds1,ds2)
- and(ds1,ds2)

Functions in the palette:

- removeValues
- thsvd
- where
- le

Buttons at the bottom: Cancel, Overplot, Plot Below, Plot.

## 18. Select BuBu...

The screenshot displays the Autoplot 20180116a software interface. The main window shows a plot titled "RBSPA/EMFISIS BuBu" with a y-axis scale of  $10^4$ . Below the plot, the "Editing URI" window is open, showing the process of loading data sets into variable names. The "Load these Data Sets into variable names:" section contains two entries:

Variable Name	URI
thsvd=	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd
BuBu=	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu

Below this, there is a checkbox for "synchronize data by time tags, interpolating data to the first dataset's time tags".

The "Drag functions onto the palette to the right." section shows a list of functions under the "mathematics" tab, including `putValues(ds,w,v)`, `removeValues(ds,w)`, `removeValuesGreaterThan(ds,v)`, `removeValuesLessThan(ds,v)`, `where(c)`, `lt(ds1,ds2)`, `le(ds1,ds2)`, `gt(ds1,ds2)`, `ge(ds1,ds2)`, `eq(ds1,ds2)`, `ne(ds1,ds2)`, `or(ds1,ds2)`, and `and(ds1,ds2)`. The `le(ds1,ds2)` function is selected.

The "Select Variable" dialog box is open, showing the following options:

Variable	URI
<input type="checkbox"/> thsvd	http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2...
<input checked="" type="checkbox"/> BuBu	vap + cdf: http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-...
<input type="checkbox"/> Literal:	0.0
<input type="checkbox"/> Expression:	le(ds1,ds2)

The "Ok" button is highlighted with a mouse cursor. At the bottom right of the main window, there are buttons for "Cancel", "Overplot", "Plot Below", and "Plot".

19. And enter the literal "1e-8" for the second argument.

The screenshot displays the Autoplot 20180116a software interface. The main window shows a menu bar (File, Edit, View, Options, Bookmarks, Tools, Help) and a toolbar with a play button and a refresh button. Below the toolbar, there are tabs for 'canvas', 'axes', 'style', 'layout', 'data', 'metadata', 'script', and 'console'. The 'data' tab is active, showing a list of data sets to be loaded into variable names. The first data set is 'thsvd' with the URL 'http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd'. The second data set is 'BuBu' with the URL 'http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\_WFR-spectral-matrix-diagonal-merged\_emfisis-L2\_20150816\_v1.5.4.cdf?BuBu'. A checkbox for 'synchronize data by time tags, interpolating data to the first dataset's time tags' is present. Below this, there are instructions: 'Drag functions onto the palette to the right.' and 'Double-click on the name to set the variable or constant argument.' A palette of functions is shown, including 'removeValues', 'where', 'le', 'BuBu', and 'ds2'. A 'Select Variable' dialog box is open, showing a list of variables: 'thsvd', 'BuBu', 'Literal: 1e-8', and 'Expression: le(ds1, ds2)'. A mouse cursor is pointing at the 'Expression' option. The dialog box has 'Cancel', 'Okay', 'Overplot', 'Plot Below', and 'Plot' buttons. At the bottom of the main window, there is a timeline showing dates '2015-08-16' and '2015-08-17'. A status bar at the very bottom indicates 'plotElement\_1 (Thetaldkin (deg)) selected'.

20. And then hit plot to see how it looks.

The screenshot displays the Autoplot 20180116a software interface. At the top, a window titled "Autoplot 20180116a" shows a menu bar (File, Edit, View, Options, Bookmarks, Tools, Help) and a toolbar with a dropdown menu set to "u/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd". Below this is a tabbed interface with "canvas", "axes", "style", "layout", "data", "metadata", "script", and "console" tabs.

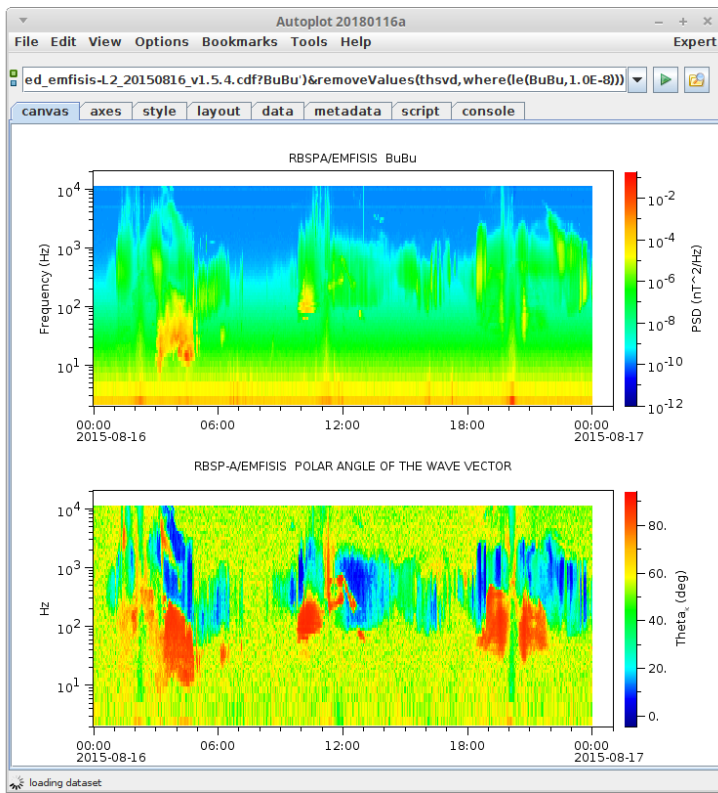
The main window, titled "Editing URI vap+inline:ds=getDataSet('http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\_wna-survey\_emfisis-L4\_20150816\_v1.5.2.cdf?thsvd')", has tabs for "data", "jython", and "mash up". It features a "Load these Data Sets into variable names:" section with a "Time Range:" dropdown. Two data sets are loaded:

- thsvd= [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\\_wna-survey\\_emfisis-L4\\_20150816\\_v1.5.2.cdf?thsvd](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd)
- BuBu= [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\\_WFR-spectral-matrix-diagonal-merged\\_emfisis-L2\\_20150816\\_v1.5.4.cdf?BuBu](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu)

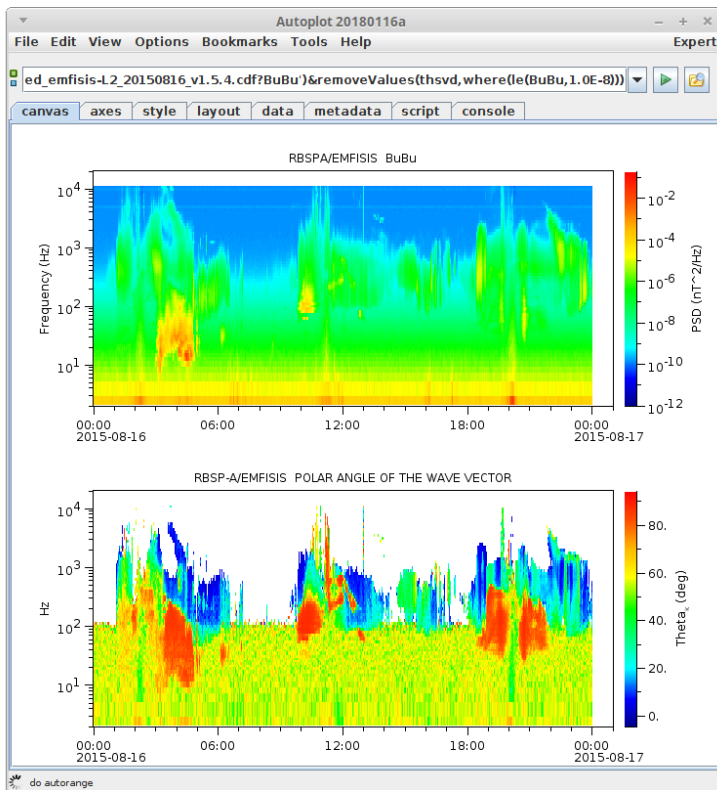
A checkbox for "synchronize data by time tags, interpolating data to the first dataset's time tags" is present. Below this is a function palette with tabs for "mathematics", "dataset", "filters", "my functions", and "all". The "filters" tab is active, showing a list of functions including "removeValues(ds,w,v)", "removeValues(ds,w)", "removeValuesGreaterThan(ds,v)", "removeValuesLessThan(ds,v)", "where(c)", "lt(ds1,ds2)", "le(ds1,ds2)", "gt(ds1,ds2)", "ge(ds1,ds2)", "eq(ds1,ds2)", "ne(ds1,ds2)", "or(ds1,ds2)", and "and(ds1,ds2)".

To the right of the function list is a tree view for the "removeValues" function, showing a "where" filter with "le" and "BuBu" (set to "1.0E-8") as arguments. At the bottom right, there are buttons for "Cancel", "Overplot", "Plot Below", and "Plot". A mouse cursor is pointing at the "Plot" button. Below the main window, a plot area shows a time range from "2015-08-16" to "2015-08-17" with a selected element "plotElement\_1 (Thetaldkin (deg)) selected".

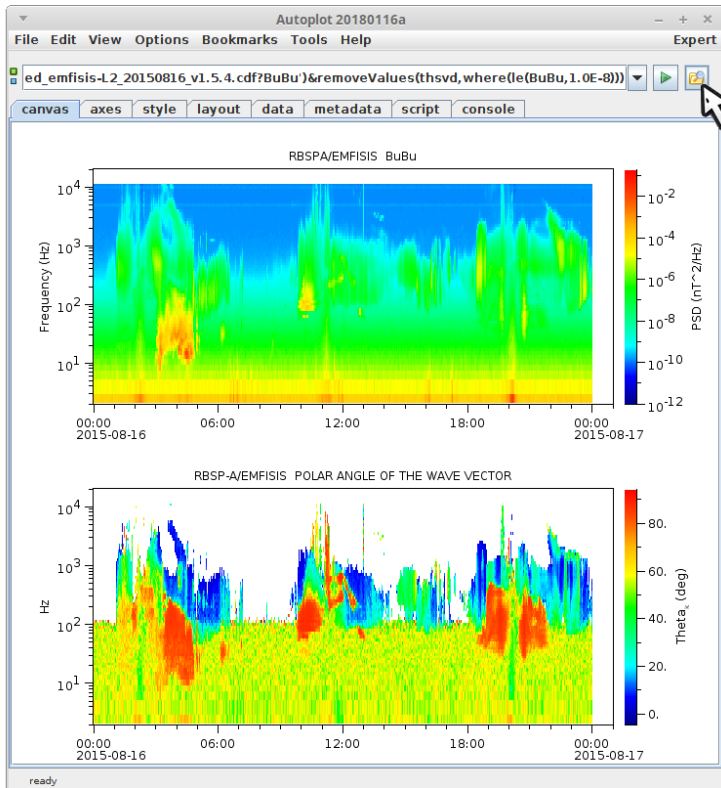
21. loading...



22. And this is loaded with the filter applied.



23. Note we can easily go back into the mash-up tool...



## 24. ...and modify the parameter.

The screenshot displays the Autoplot 20180116a software interface. At the top, a menu bar includes File, Edit, View, Options, Bookmarks, Tools, and Help. Below the menu bar, a toolbar contains icons for file operations and a play button. The main workspace shows a mashup configuration with two data sets:

- thsvd=** [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a\\_wna-survey\\_emfisis-L4\\_20150816\\_v1.5.2.cdf?thsvd](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L4/2015/08/16/rbsp-a_wna-survey_emfisis-L4_20150816_v1.5.2.cdf?thsvd)
- BuBu=** [http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a\\_WFR-spectral-matrix-diagonal-merged\\_emfisis-L2\\_20150816\\_v1.5.4.cdf?BuBu](http://emfisis.physics.uiowa.edu/Flight/RBSP-A/L2/2015/08/16/rbsp-a_WFR-spectral-matrix-diagonal-merged_emfisis-L2_20150816_v1.5.4.cdf?BuBu)

A checkbox labeled "synchronize data by time tags, interpolating data to the first dataset's time tags" is present. Below this, a function palette is visible with tabs for "mathematics", "dataset", "filters", "my functions", and "all". The "mathematics" tab is active, showing a list of functions including add(x,y), subtract(x,y), multiply(x,y), divide(x,y), pow(x,y), log10(x), sqrt(x), abs(x), magnitude(x), toRadians(x), toDegrees(x), sin(x), cos(x), tan(x), acos(x), and atan2(y,x). A tree view on the right shows the current function configuration: removeValues(thsvd, where(le(BuBu, 1.0E-8))). A "Select Variable" dialog box is open, showing the configuration for the variable "le":

- thsvd
- BuBu
- Literal: 1.0E-6
- Expression:

The dialog box has "Cancel" and "Okay" buttons. A mouse cursor is pointing at the "Okay" button. At the bottom of the interface, there are buttons for "Overplot", "Plot Below", and "Plot". The status bar at the bottom shows the date "2015-08-16" and "2015-08-17", and the text "ready".



