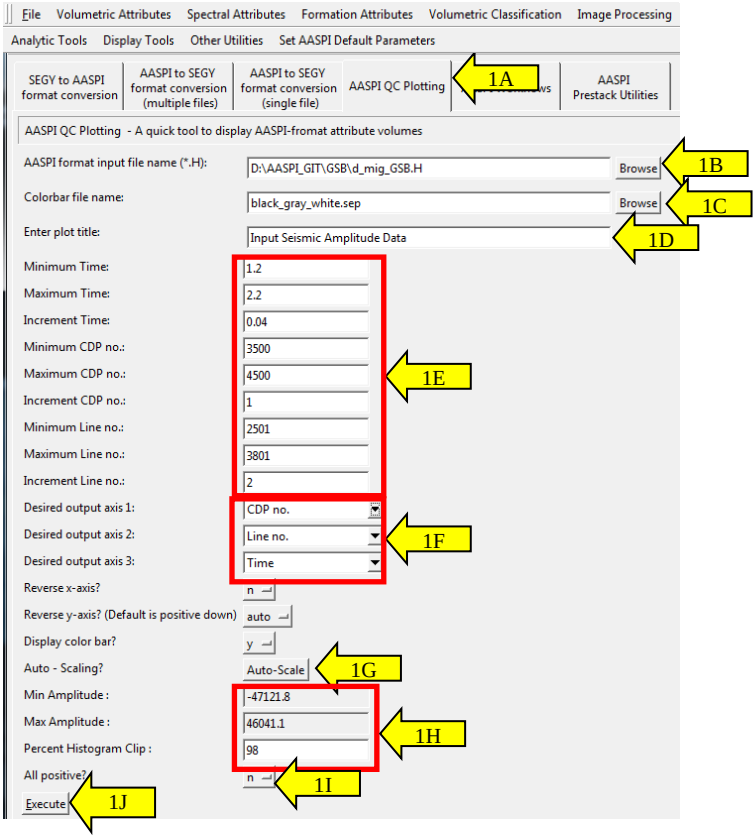
QC PLOTTING POST-STACK AASPI-FORMAT DATA

Contents

The AASPI QC Plotting Tab

To further quality control the conversion process of post-stack seismic data, you will wish to plot your data before computing seismic attributes. You will also wish to plot your attributes before converting them to SEGY format prior to importation into your interpretation workstation software. In the **aaspi_util** GUI (1A) Click the tab labeled *'AASPI QC Plotting'*. The panel below appears.



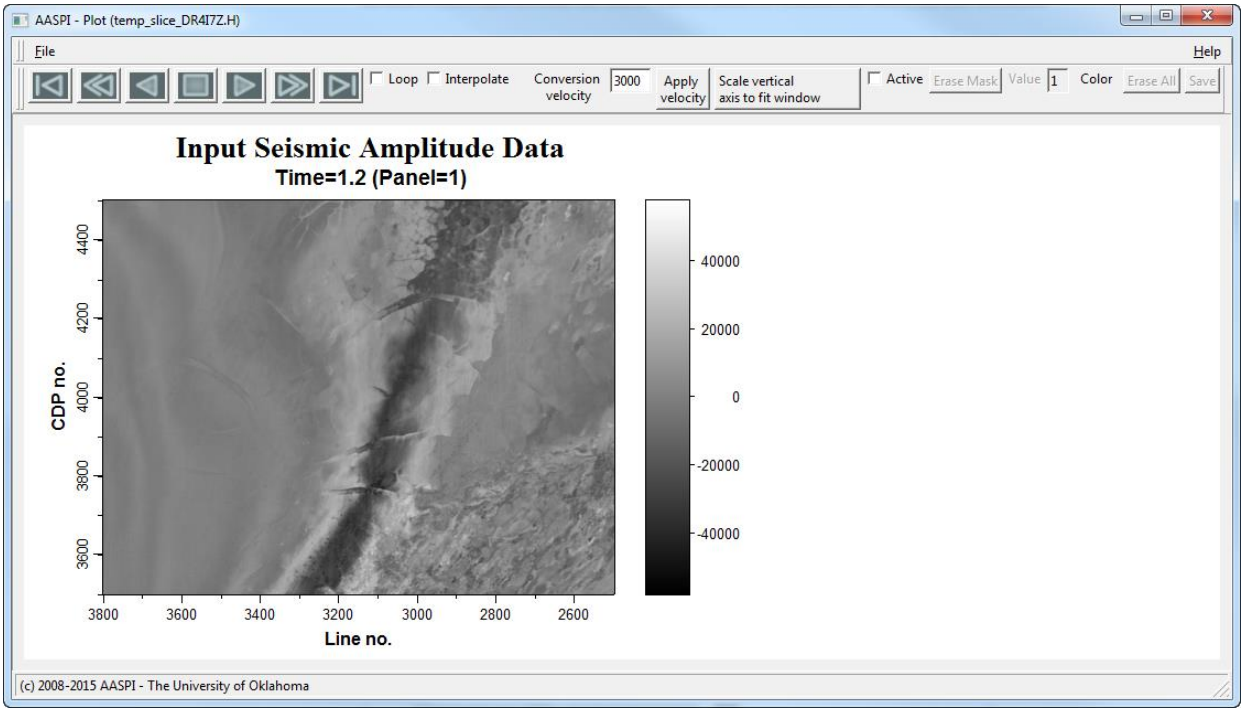
(1B) Click Browse and select the *AASPI-format file (*.H)* that you want to display.
After you browse the file, the *Colorbar file name* (1C), plot title (1D), and all axes parameters (1E)

are automatically loaded. You can change all those fields to your need. By default, desired axes 1, 2, 3 are time, cdp, and line, respectively (1F). This default selection corresponds to inline display type, where each panel is an inline view; with cdp as the horizontal axis and time as the vertical axis. To change the display type to cross-line view, make sure the desired axis 3 is "CDP no.". Similarly, to change the display type to time-slice view, make sure the desired axis 3 is "Time".

Note that each time you change the display type, the increment value for the 3rd axis would be set to be 10x the original increment. For example, if you select time as the 3rd axis, and your sample interval is 0.004s, then the time increment is automatically set at 0.04s. This is recommended because it would help increase the display loading speed by cropping the data to the new increment of the 3rd axis and generate a smaller volume to be displayed. By default, auto-scaling is active (1G). This means that the program will use statistical percentage clip to scale the data to an appropriate color level. The default percentage histogram clip is 98 (1H), meaning only values between 1% and 99% of the data statistical distribution will be taken into the scaling process. Data that falls below 1% or above 99% of the distribution would be clipped. Anything between 1% and 99% distribution will be scaled. This is useful when you are comparing seismic amplitude data with different processing flows or different surveys that have different range of values.

Clicking on (1G) *Auto-Scale* would switch between auto-scaling and fixed-scaling modes. In fixed-scale mode, you need to define a minimum and maximum values (1H). These values are automatically loaded when you browse the input file and you can always change them to your need. Data that falls below the minimum or above the maximum would be clipped. The display color would be scaled linearly from a minimum value to a maximum value. If the browsed data has both positive and negative values (e.g. seismic amplitude, curvatures…), specify All-positive to "n" (1I). Otherwise (e.g. coherence, dip magnitude…) select "y".

After all the parameters are set, click *Execute* (1J).
The following figure generated by the program **aaspi_plot** appears:


AASPI - Plot (temp_slice_DR4I7Z.H)
File
Help
Loop
Interpolate
Conversion velocity
3000
Apply velocity
Scale vertical axis to fit window
Active
Erase Mask
Value
1
Color
Erase All
Save
Input Seismic Amplitude Data
Time=1.2 (Panel=1)
CDP no.
4400
4200
4000
3800
3600
Line no.
3800
3600
3400
3200
3000
2800
2600
40000
20000
0
-20000
-40000
(c) 2008-2015 AASPI - The University of Oklahoma

Looking under the hood: GUIs, parameter files, shell scripts, and application programs

A few users and the system administrators may wish to know how we have put this software together. The components were discussed in reviewing our migration plans to support Windows in Section 1. The AASPI software is driven by a collection of graphical user interfaces (GUIs) written in C++ and using the Fox toolkit. These GUI read default and user-supplied parameters to generate a parameter file, which for the QC plotting program here is called ***aaspiviewer.parms***:

```
[kmarfurt@tripolite boonsville]$ cat aaspiviewer.parms
aaspi_fn=/nfs/raid1/home/kmarfurt/projects/boonsville/d_mig_boonsville.H
colorbar_fn=black_gray_white.sep
plot_title="Input Seismic Amplitude Data"
plotsection=0
gainpanel=every
wantscalebar=y
min1=0
max1=1.5
inc1=0.1
min2=74
max2=206
inc2=1
min3=105
max3=201
inc3=1
minval=-121406
maxval=149036
allpos=n
fixed_scale=0
xreverse=n
yreverse=auto
```

The GUI invokes a python script *${AASPIHOME}/pyscripts/ aaspi_aaspiviewer_poststack.py*. The python script reads the parameters from the **.parms* file, processes them, and then invokes application program **aaspi_plot** (written in C++ and also using the Fox toolkit). The bulk of our applications is written in Fortran95, run in parallel under MPI, and is not interactive. This four-layer software architecture provides an interactive user interface, computationally efficient application codes, glued together with python scripts that provide multiplatform capabilities on Linux and Windows.

If you were to inspect *${AASPIHOME}/pyscripts/ aaspi_aaspiviewer_poststack.py* you would see that it reads the parameter values from the parameter file, such as those which determine whether we wish to plot time slices or vertical slices, a call to program **crop** that crops the data according to the input parameters, and program **slice** that generates time slices from the input cropped data sub-volume, prior to calling program **aaspi_plot** that actually plots the seismic data. Since we no longer will use pipes in order to move to Windows, we need to define temporary intermediate files. Unique ***temp_sliced*** and ***temp_cropped*** files are created by appending the time of execution to the file name. These temporary files are deleted when program **aaspi_plot** is closed. Occasionally, your system connection may be interrupted or a process may terminate abnormally. Nothing will be damaged if you remove any of the **.parms* or *temp** files in any of your directories.