

DISPLAYING HEADER VALUES – PROGRAM **display_aaspi_headers**

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Overview

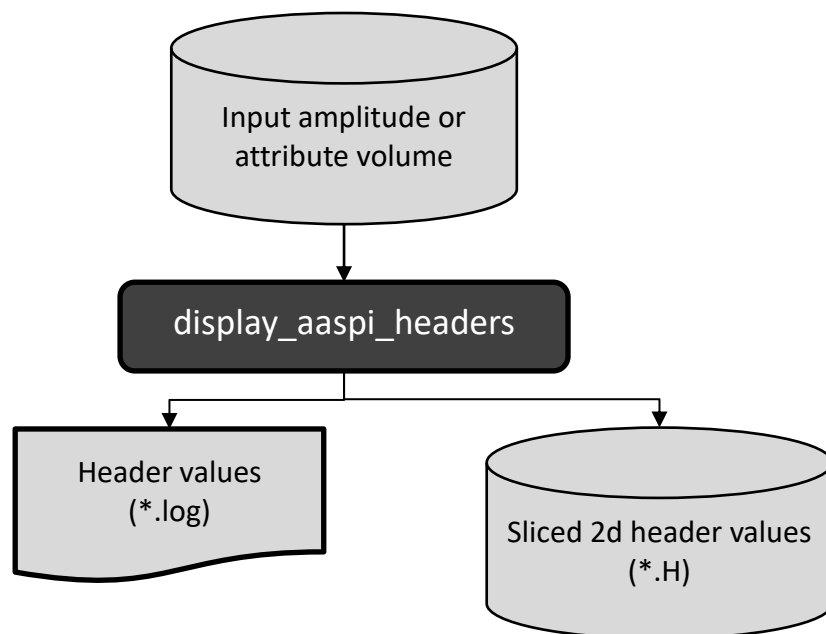
Headers cause headaches, so sometimes we need to look at their values to make sure they make sense. Program **display_aaspi_headers** allows you to see what values are stored in the *.H@@ and *.H@@@ files and to quality control them for accuracy. The most important headers for the AASPI routines have the keywords:

Header keyword	Header description
line_no	The inline index
cdp_no	The CDP or crossline index
offset	The binned source-receiver offset of a prestack migrated gather
azimuth	The binned source-receiver azimuth of a prestack migrated gather
trid	The trace identification index where values of 1 indicates a live trace, 2 a dead trace, and 3 a padded trace.
mute	The end of the early mute in ms (m, ft) - i.e. the time (depth) of the first live sample of the trace.
muts	The start of the late mute in ms (m, ft) - i.e. the time (depth) of the last live sample of the trace.
laga	Time of the first sample in ms (m, ft)

Computation flow chart

Program slice has a single input file and outputs the headers to the *.log file.

Other Utilities: Program **display_aaspi_headers**



Output file naming convention

Program **display_aaspi_headers** always generates two output files:

Output file description	File name syntax
Program log information	display_aaspi_header_ <i>unique_project_name_suffix</i> .log
Program error/completion information	display_aaspi_header_ <i>unique_project_name_suffix</i> .err

where the values in red are defined by the program GUI. The errors we anticipated will be written to the *.err file and be displayed in a pop-up window upon program termination. These errors, much of the input information, a description of intermediate variables, and any software trace-back errors will be contained in the *.log file.

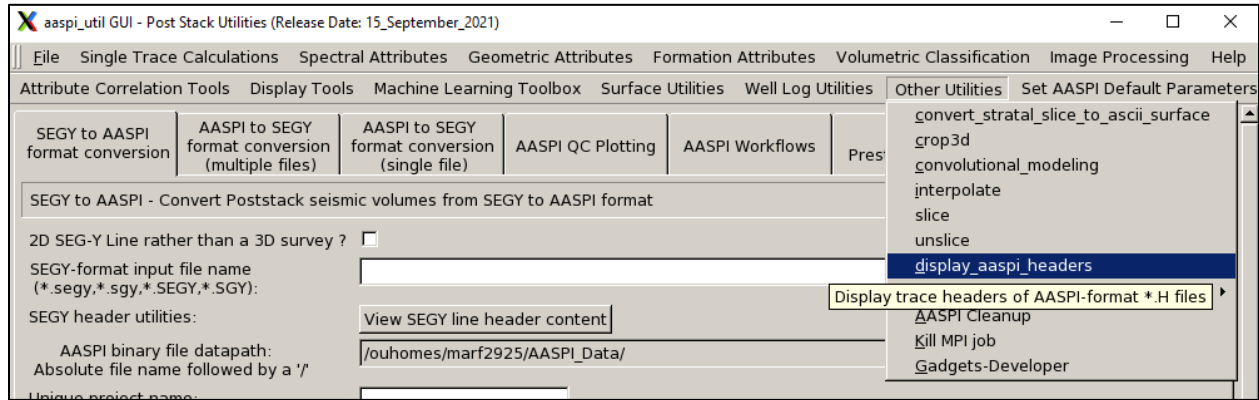
If desired, program **display_aaspi_headers** will also generate the following output files useful for graphically displaying the headers:

Output file description	File name syntax
Header values for display	header_display_ <i>unique_project_name_suffix</i> .H

Other Utilities: Program **display_aaspi_headers**

Example 1: Displaying and plotting AASPI headers

In the main **aaspi_util** GUI, go to *Other Utilities* and find *display_aaspi_headers* in the drop-down tab:



The following GUI appears:

Other Utilities: Program **display_aaspi_headers**

aaspi_display_aaspi_headers GUI (Release Date: 15_September_2021)

File Help

Display AASPI Headers

Program to read and print out desired header values in ascii format

AASPI Input (*.H): /ouhomes6/marf2925/projects/jie_Qi_bug/GoldenRe.H Browse 1

Header key selection Select Header Keys to be Displayed 2

Generate a header plot? 3

First CDP no.: 1 4

Last CDP no.: 145

Increment CDP no.: 10

First Line no.: 1

Last Line no.: 145

Increment Line no.: 10

First : 1

Last : 1

Increment : 10

First : 1

Last : 1

Increment : 10

First : 1

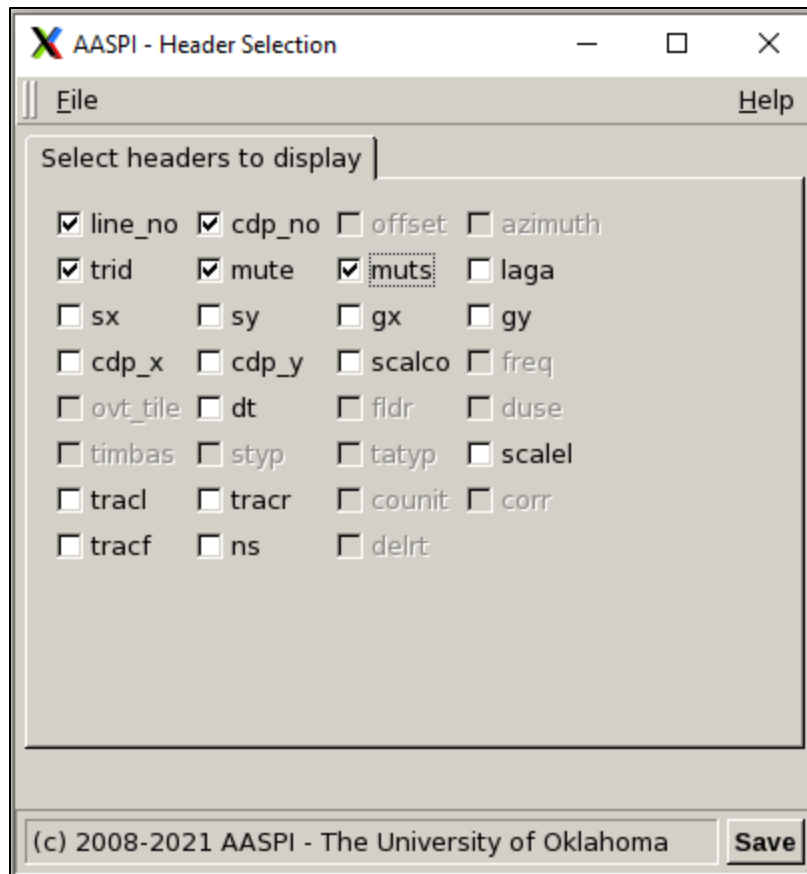
Last : 1

Increment : 10

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Browse to the (1) AASPI-format *.H file of the volume to be examined. Next, (2) click the Select Header Keys to be Displayed tab to open the following GUI:

Other Utilities: Program **display_aaspi_headers**



In this GUI, headers that are defined in the corresponding *.H@@ header file format (hff) file will be in black; headers that are missing will be grayed out. Here, I wish to inspect the headers line_no, cdp_no, trid, mute, and muts, so I place a checkmark in front of the them and click *Save*. Returning to the main GUI, I can optionally (3) place a checkmark in front of *Generate a header plot*. For now, I leave this box unchecked and choose to print a subset of the headers in the *.log file. This file was a small 3D 145 line × 145 cdp file provided by a sponsor to help track down a header problem. I set the (3) range of the header data axes and their increments, to avoid printing every header in the volume and click *Execute* to see the following data appear in my screen (stored to my *.log file):

Other Utilities: Program `display_aaspi_headers`

"line_no:cdp_no:trid:mute:muts"									
jkey	key_name	key_number							
1	line_no	19							
2	cdp_no	20							
3	trid	7							
4	mute	17							
5	muts	18							
j6	j5	j4	j3	j2:	line_no	cdp_no	trid	mute	muts
			1	1:	1	1	2	2000	2000
			1	11:	1	11	1	2000	4000
			1	21:	1	21	1	2000	4000
			1	31:	1	31	1	2000	4000
			1	41:	1	41	1	2000	4000
			1	51:	1	51	1	2000	4000
			1	61:	1	61	1	2000	4000
			1	71:	1	71	1	2000	4000
			1	81:	1	81	1	2000	4000
			1	91:	1	91	1	2000	4000
			1	101:	1	101	1	2000	4000
			1	111:	1	111	1	2000	4000
			1	121:	1	121	1	2000	3996
			1	131:	1	131	1	2000	4000
			1	141:	1	141	1	2000	4000
			11	1:	11	1	1	2000	4000
			11	11:	11	11	1	2000	4000
			11	21:	11	21	1	2000	4000
			11	31:	11	31	1	2000	4000
			11	41:	11	41	1	2000	4000
			11	51:	11	51	1	2000	4000
			11	61:	11	61	1	2000	4000
			11	71:	11	71	1	2000	4000
			11	81:	11	81	1	2000	4000
			11	91:	11	91	1	2000	4000
			11	101:	11	101	1	2000	4000
			11	111:	11	111	1	2000	4000
			11	121:	11	121	1	2000	4000
			11	131:	11	131	1	2000	4000

Examining the last column, I see that there is a suspicious header for line_no=1 and cdp_no=121 of muts=3996. I also note that line_no=1, cdp_no=1 had trid=2, indicating a dead trace. Often, the simple display indicates what the problem with the headers is.

This particular problem was more subtle, so I go back to the GUI and click (2) Generate a header plot. Then I drop down to (3) and set the increments to be equal to 1 so that I plot every header value. I click Execute and obtain a file called header_display_headaches.H which I will plot using the *AASPI QC Plotting* tool:

Other Utilities: Program **display_aaspi_headers**

aaspi_util GUI - Post Stack Utilities (Release Date: 15_September_2021)

File Single Trace Calculations Spectral Attributes Geometric Attributes Formation Attributes Volumetric Classification Image Processing Help

Attribute Correlation Tools Display Tools Machine Learning Toolbox Surface Utilities Well Log Utilities Other Utilities Set AASPI Default Parameters

SEGY to AASPI format conversion AASPI to SEGY format conversion (multiple files) AASPI to SEGY format conversion (single file) AASPI QC Plotting AASPI Workflows AASPI Prestack Utilities

AASPI QC Plotting - A quick tool to display AASPI-format attribute volumes

AASPI format input file name (*.H): header_display_headaches.H Browse

Colorbar file name: rainbow.alut Browse

Enter plot title: AASPI headers: line_no cdp_no trid mute muts

Minimum Header value (): 1

Maximum Header value (): 5

Increment Header value (): 1

Minimum CDP no.: 1

Maximum CDP no.: 141

Increment CDP no.: 1

Minimum Line no.: 1

Maximum Line no.: 141

Increment Line no.: 1

Desired output axis 1: Line no.

Desired output axis 2: CDP no.

Desired output axis 3: Header value

Reverse x-axis? n

Reverse y-axis? (Default is positive down) auto

Display color bar? y

Wiggle plot instead of color image? ☐

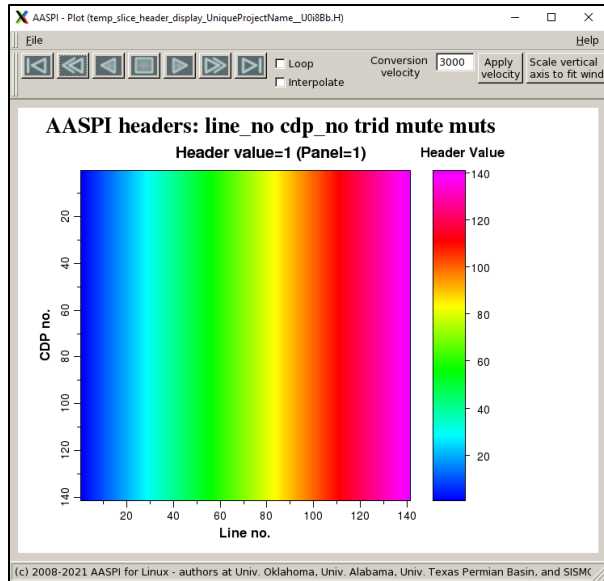
Automatic wiggle scaling? ☒

Fill positive parts of wiggles? ☒

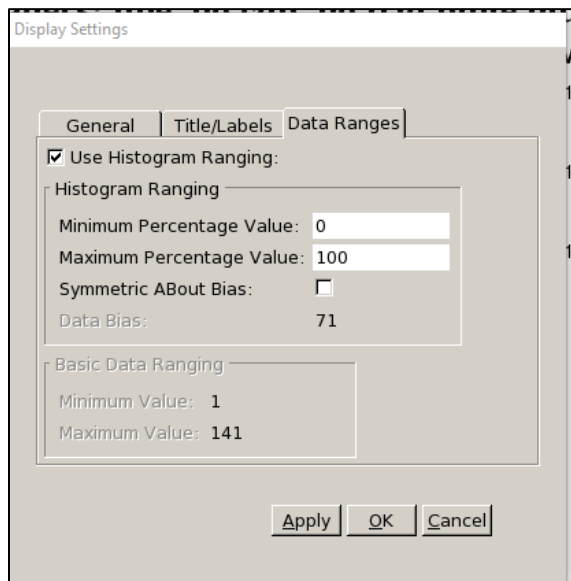
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Note that the length of axis 1 (the header values) is 5, because I put a check mark in front of the 5 headers. I need to slice them to have a useable plot, so I drop down and set *Desired output axis 3* to be *Header value*. I get the following plots of the line_no:

Other Utilities: Program **display_aaspi_headers**

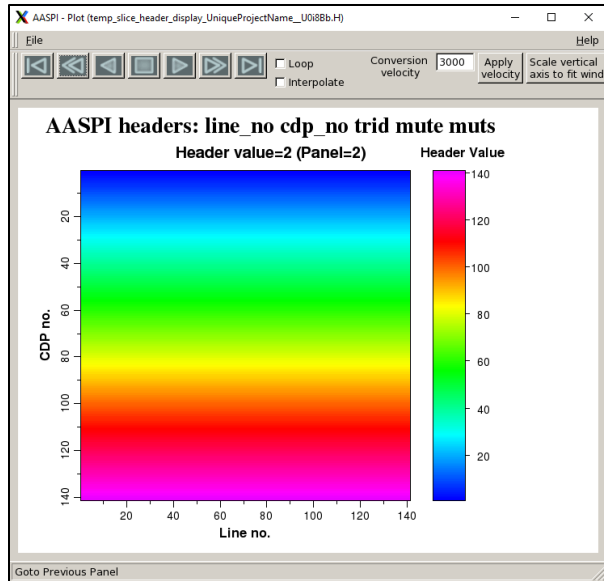


where I have modified the default plot Settings to set the ranges from the 0 to the 100 percentile:

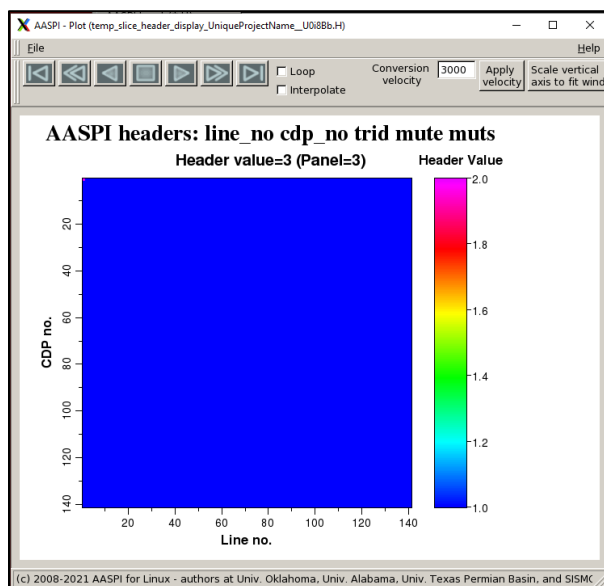


The order of the headers is listed in the title. So the next one is the `cdp_no`:

Other Utilities: Program `display_aaspi_headers`

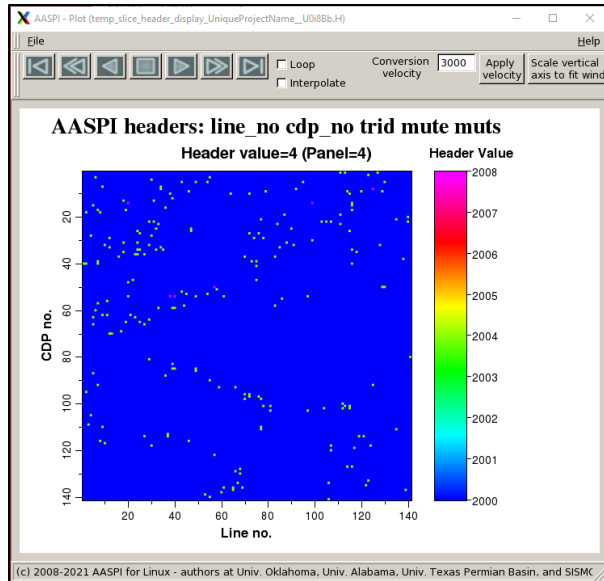


Next is the trace ID where I see the range between 1 and 2 and value of 2 in the upper left:



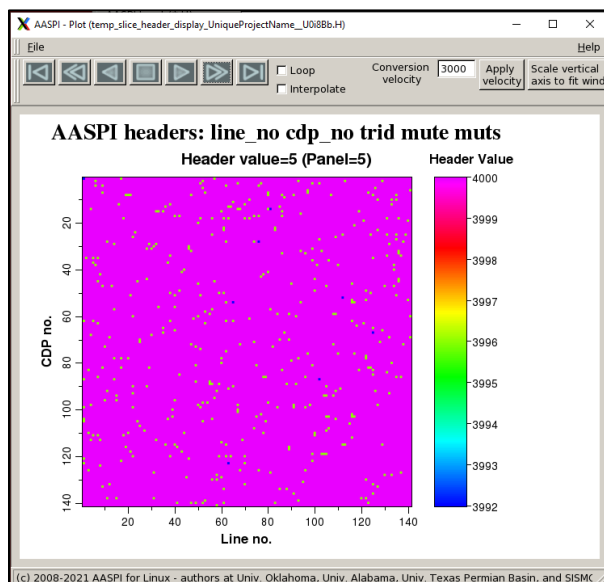
The fourth header is mute which ranges between 2000 and 2008 ms:

Other Utilities: Program **display_aaspi_headers**



This data volume was cropped in an external program at $t=2000$ ms, so the speckles are bad values that somehow were brought in converting the data at some previous process.

The last header, muts, has a value of 2000 for the dead trace in the upper left, so I change the range of the plot to be from 3992 to 4000 ms and obtain the following image:



You may think that “now, the hard part begins!” Actually, I spent two days tracking down artifacts in coherence and in dip in the first and last few time slices before realizing it was a header problem. Headers give you headaches!