



Computation flow chart



Computing rose diagrams

To generate rose diagrams, we invoke the program generate_roses under the *Display tools* tab:

File Volumetric Attributes Eormation	attributes Display Tool	Other Litilities	Set AASPI Default Parame	tors Hole
SEGY to AASPI format conversion (multiple files)	ASPI to SE <u>h</u> lplot rmat conve <u>h</u> splot (single fil h <u>l</u> splot		rkflows AASPI Prestack Uti	lities
AASPI QC Plotting - A quick tool to display AASPI format input file name (*.H): Colorbar file name: Enter plot title: Plot section: Minimum Time/ Depth: Maximum Time/ Depth: Time/Depth Increment:	AASPI-frc µler_boo µler_boo µlet_4d_si	ectral_component oses es	s	
Minimum CDP: Maximum CDP: CDP Increment Minimum Inline: Maximum Inline:	74 206 1 105 201			
Gain panel: Reverse x-axis? Reverse y-axis? (Default is positive down) Want scale bar? Auto - Scaling? Min Amplitude :	every	_		
Max Amplitude : All positive? Execute	2.52315E-05 n			

In the GUI below, (1) set the Lineament Magnitude to be $k_valley_boonsville_long_w_filt.H$, and (2) the Lineament Azimuth to be $k_min_azim_boonsville_long_w_filt.H$. The default (3) Number of petals per 90 degree is 6 resulting in 15⁰- petals. Set the (4) Maximum Rose Radius (unit2) to be 1100 ft (or 21 bins by 21 bins for our 110 ft b y 110 ft bin size). Generating a rose diagram has some image processing components to it. To avoid dominating the calculation by one or two large events within the window, we (5) clip the very largest values to a value of Magnitude Upper Threshold. We do not count any low amplitude lineaments whose value is less than (6) Magnitude Lower Threshold.

ſ	AASPI - program generate_roses (Release Date: October 15, 2012)						
	∬ <u>E</u> ile						
	Generate automatic rose diagrams out of the volumetric attributes lineament (valley or ridge) and azimuth of lineament.						
	Lineament Magnitude(*.H):	le_long_wavelength_filt.H	Browse				
	Lineament Strike(".H):	le_long_wavelength_filt.H	Browse				
	*Unique Project Name:	boonsville					
	Suffix:	long_w_filt					
	Typical Extended						
3	Maximum Rose Radius (u	unit2): 1100					
4	Number of petals per 90 d	legree: 6					
	Percentage to fill a rose p	etal: 0					
5	Upper magnitude clip	value: 0.001					
	Use a negative value for	kz, e_neg,)					
6	(Use a negative value fo	r k2, e_neg,)					
	Scan input data for threshol	ds					
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The figure from Mai et al. (2009) describes the process. The attribute volume is first broken into a suite of non-overlapping rectangular analysis windows for every time slice. Within each window each voxel is examined. First, the proper rose petal is computed from the azimuth of minimum curvature volume. Then the value of the lineament is compared against the upper and lower threshold. The resulting (perhaps clipped or zero) value is then added into the appropriate rose petal. The process is repeated for all the voxels within the analysis window.



The results for our Boonsville survey time slice looks like the image below:



The lineament values range between -90 and +90. The black areas outside the roses have been set to non-realizable values of either -180 or +180. The white area analysis window boundaries have been set to values of \pm -100. In this manner, the rose diagrams can be converted to SEGY format, loaded into your interpretation workstation, and by making values greater than 90[°] or less than -90[°] transparent, can be co-rendered with your seismic data or other attribute.