

In cigar probe an average value of the attribute is computed in a cylinder around the well bore path, this value is weighted by inverse of distance. The output of the cigar probe is one value for per well, with an assumption that the each point on the well bore path in the horizontal section is contributing equally.



Figure 1: Illustration of the cigar probe workflow: (a) vertical and horizontal wells in the Lower Barnett Shale, (b) The flow (production) to each perforation can be approximated by the impulse response on Green's function 1/R. (c) I assume all the sections to be perforated and completed equally. The result is a cigar-shaped volume with flow

approximation of 1/R perpendicular to the well bore (Fernandez, 2013



and Verma, 2015).

Another illustration for cigar probe through TOC volume.

Cigar probe can be launched by typing aaspi_cigar_probe on the terminal

window. The following window will pop-up :

Attribute Correlation: Program cigar_probe

🗙 AASPI - program cigar_probe (Release Date: April	27, 2015)							
]] <u>F</u> ile		<u>H</u> elp						
Generate cigar probes for a suite of wells through a seismic attribute volume and correlate to production								
Input Attribute Filename (*.H):	igarprobe/SecondEstimates/TOC_Depth_forAaspi.H	Browse 1						
Input Well Location Filename (ascii format):	ates/Horizontal_Wells_Fairview_Ready_For_Cigar.txt	Browse 2						
Input shallower horizon filename:	ject/TOC_BI_cigarprobe/SecondEstimates/LB_Depth	Browse 3						
(Choose Horizon Type Below:)		View horizon file Convert DOS to Unix						
Input deeper horizon filename:	/TOC_BI_cigarprobe/SecondEstimates/Viola_Depth1	Browse 4						
(Choose Horizon Type Below:)	4	View horizon file Convert DOS to Unix						
*Unique Project Name:	Tođ 5							
Suffix:								
Choose horizon type:	gridded (e.g. EarthVision) ▼							
Number of header lines to skip:	0							
Total number of columns:	3							
Column number of line_no:	1							
Column number of cdp_no:	2							
Column number of picks:	3							
znull value (indicates missing pick):	-999999							
Window start wrt horizon in kft	-0.05							
Window end wrt horizon in kft	0.05							
Vertical axis of picked surface?	Positive Down Vertical Units of ft Picked Horizon:	Y						
Cigar radius (ft) :	550 7							
Ref. velocity (ft/kft) :	10000							
Convolve with 1/R**2 Green's function ?								
(c) 2008-2015 AASPI - The University of Ok	lahoma	Execute						

Here, input (1) the volumetric attribute volume, (2) Input well file, the format of this file is described in the next section. (3) The target top surface e.g. Forestburg surface in earth vision format see the next section, (4) the target bottom surface e.g. Ellenburger surface. (5) Unique project name will be attached to the output file name. (7) Radius of influence for cigar probe, (8) reference velocity, if the volume (kft) as well as surfaces (ft) are in depth use ref vel =500.

Input well file format

The input file should be in following format

This 1	ine	will not be r	ead														
This line will alog be not read																	
Name		TD	х	Y	Inline	Xline	Depth	Time	х	Y	Inline	Xline	Depth	Time	Azim I	length	Production
		(tyd)	(Top-Surf)	(Top-Surf)	(Top-Surf)	(Top-Sur	f) (Top-Surf) (Top-Surf)	(Toe)	(Toe)	(Toe)	(Toe)	(Toe)	(Toe)			
zseg	τ	Azim	Relative_EUR														
H47		6820.23	2024419.99	522815.02	51.00	54.00	6683.58	6683.58	2023515.89	525867.40	44.00	83.00	6683.58	6683.58	286.50	3183.	46 7.00
H42		6780.64	2020243.99	536398.02	13.00	178.00	6688.86	6688.86	2023130.95	535284.44	41.00	169.00	6688.86	6688.86	158.91	3094.	28 4.32

In sequence the columns would be :

1. Well Name 2. TD (Total vertical depth); 3. X-coordinate 4. Y

- coordinate 5. Inline, 6. Xline, 7. Depth 8. Time (from 3-8: well and top target surface crossing point)

9. X-coordinate 10. Y – coordinate 11. Inline, 12. Xline, 13.
Depth 14. Time (from 9- 14 : well toe) . 15. Azimuth of the segment between the two target surfaces, (16). Length of the well segment between the two wells. (17) Well production.

Input surface format (earth-vision)

<pre>1 # Type: scattered data 2 # Version: 6 3 # Description: No description 4 # Format: free 5 # Field: 1 x 6 # Field: 2 y 7 # Field: 3 z feet 8 # Field: 4 column 9 # Field: 5 row 10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 12 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 24 202050.000000 518800.000000 7018.464844 13 2 25 202060.000000 518800.000000 7018.161621 14 2 26 2020650.000000 518800.000000 7015.364746 16 2 28 2020750.000000 518800.000000 7014.772461 17 2</pre>		
<pre>2 # Version: 6 3 # Description: No description 4 # Format: free 5 # Field: 1 x 6 # Field: 2 y 7 # Field: 3 z feet 8 # Field: 4 column 9 # Field: 5 row 10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.00000 518800.00000 7016.443848 10 2 22 2020450.00000 518800.00000 7015.145020 12 2 24 2020550.00000 518800.00000 7018.464844 13 2 25 202060.00000 518800.00000 7016.391602 15 2 27 2020700.00000 518800.00000 7014.772461 17 2</pre>	1	# Type: scattered data
<pre>3 # Description: No description 4 # Format: free 5 # Field: 1 x 6 # Field: 2 y 7 # Field: 3 z feet 8 # Field: 4 column 9 # Field: 5 row 10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 24 2020550.000000 518800.00000 7018.464844 13 2 25 2020600.000000 518800.000000 7018.161621 14 2 26 2020650.000000 518800.000000 7016.391602 15 2 27 2020700.000000 518800.000000 7014.772461 17 2</pre>	2	# Version: 6
<pre>4</pre>	3	# Description: No description
<pre>5</pre>	4	# Format: free
<pre>6</pre>	5	# Field: 1 x
<pre>7 # Field: 3 z feet 8 # Field: 4 column 9 # Field: 5 row 10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 24 2020500.000000 518800.000000 7018.464844 13 2 25 2020600.000000 518800.000000 7016.391602 15 2 27 2020700.000000 518800.000000 7015.364746 16 2 28 2020750.000000 518800.000000 7014.772461 17 2</pre>	6	# Field: 2 y
<pre>8 # Field: 4 column 9 # Field: 5 row 10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7014.488281 11 2 23 2020500.000000 518800.000000 7015.145020 12 2 24 2020550.000000 518800.000000 7018.161621 14 2 25 2020600.000000 518800.000000 7018.161621 14 2 26 2020650.000000 518800.000000 7015.364746 16 2 27 2020750.000000 518800.000000 7014.772461 17 2</pre>	7	# Field: 3 z feet
<pre>9 # Field: 5 row 10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 24 2020550.000000 518800.000000 7018.464844 13 2 25 2020600.000000 518800.000000 7016.391602 15 2 27 2020700.000000 518800.000000 7015.364746 16 2 28 2020750.000000 518800.000000 7014.772461 17 2</pre>	8	# Field: 4 column
<pre>10 # Projection: Local Rectangular 11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 23 2020500.000000 518800.000000 7018.464844 13 2 24 2020550.000000 518800.000000 7018.161621 14 2 25 2020600.000000 518800.000000 7015.364746 16 2 27 2020700.000000 518800.000000 7015.364746 16 2 28 2020750.000000 518800.000000 7014.772461 17 2</pre>	9	# Field: 5 row
<pre>11 # Units: feet 12 # End: 13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 24 2020550.000000 518800.000000 7018.464844 13 2 25 2020600.000000 518800.000000 7018.161621 14 2 26 2020650.000000 518800.000000 7015.364746 16 2 27 2020700.000000 518800.000000 7014.772461 17 2</pre>	10	<pre># Projection: Local Rectangular</pre>
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<pre>13 # Information from grid: 14 # Grid_size: 780 x 526 15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7014.488281 11 2 23 2020500.000000 518800.000000 7015.145020 12 2 24 2020550.000000 518800.000000 7018.464844 13 2 25 2020600.000000 518800.000000 7018.161621 14 2 26 2020650.000000 518800.000000 7016.391602 15 2 27 2020700.000000 518800.000000 7014.772461 17 2</pre>	12	# End:
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<pre>15 # Grid_space: 2019950.000000,2058900.000000,518750.00000 16 # Scattered data: Not_available 17 # Z_field: z 18 # Vertical_faults: Not_available 19 # History: No history 20 # Z_units: feet 21 2020400.000000 518800.000000 7016.443848 10 2 22 2020450.000000 518800.000000 7015.145020 12 2 23 2020500.000000 518800.000000 7018.464844 13 2 24 2020550.000000 518800.000000 7018.161621 14 2 25 2020600.000000 518800.000000 7016.391602 15 2 27 2020700.000000 518800.000000 7014.772461 17 2</pre>	14	# Grid_size: 780 x 526
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	28	2020750.000000 518800.000000 7014.772461 17 2

Output file:

The name of the file will be correlation_unique project name_suffix.H

Output of the file can be opened with accii reader.

Input	Seismic Amp	litude Data			
	well no.	wellname	correlationweighted	avg co	production
	1	H47	8.190	2.838	7.000
	2	H42	8.050	2.871	4.320
	3	Н9	4.411	3.046	5.220
	4	H10	10.529	2.941	4.850