

*Caratterizzazione delle rocce di copertura e completamento dell'analisi della  
fratturazione nelle rocce del potenziale reservoir.*

## ***Allegato 5***

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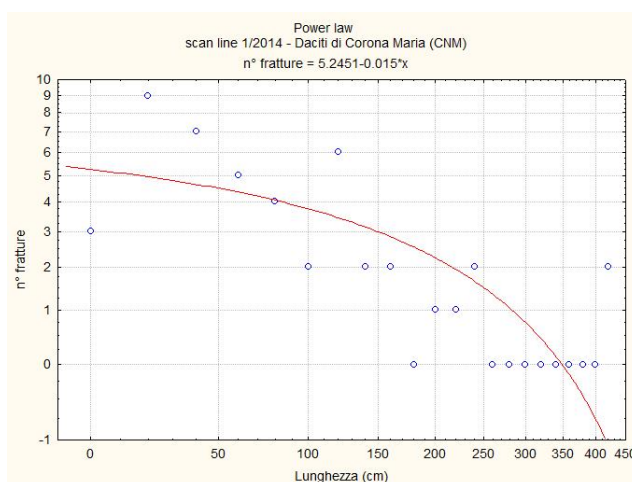
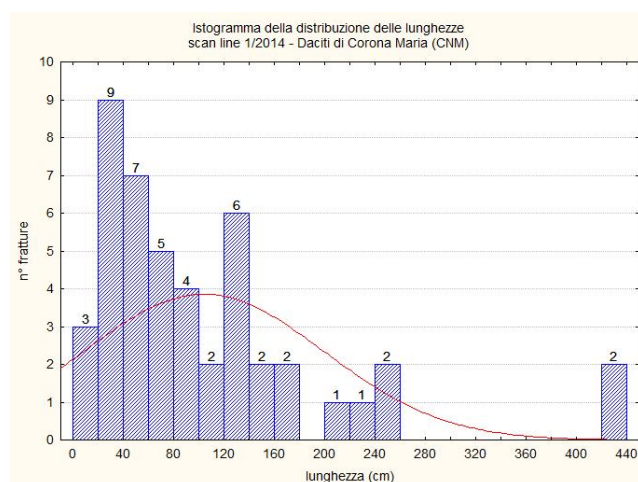
## PARAMETRI INIZIALI E FINALI DI TUTTI I DFN REALIZZATI

### Analisi dei set di fratture

Scan line 1/2014 – Daciti di Corona Maria (CNM)

Depositi piroclastici di flusso di colore bruno, da densamente saldati fino a non saldati (tufi a lapilli pomicei), a composizione dacitica. La scan line 1/2014 ha una direzione N35E e una lunghezza di 5.9 metri.

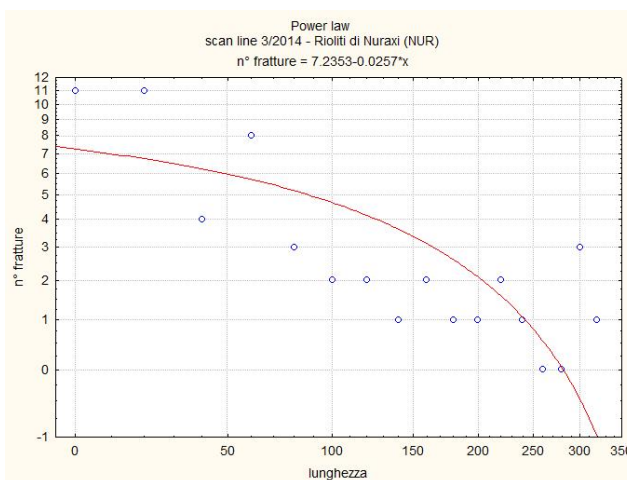
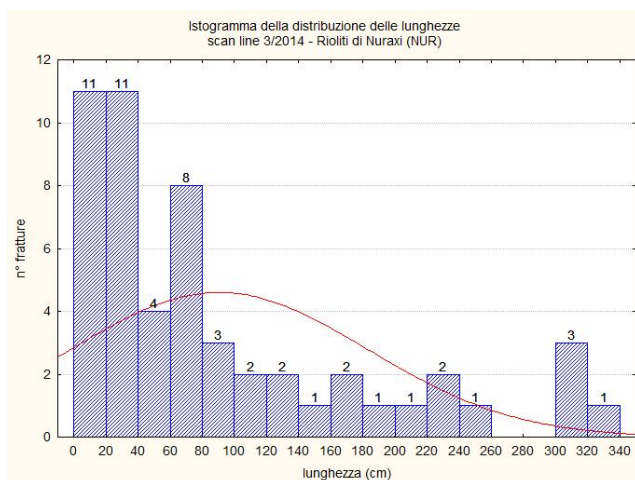
n° set	MRO	k Fisher	n° fratture	P32
1	77.2/227.77	69.8	8	1.355932
2	73.84/260.03	27.18	10	1.694915
3	63.45/172.8	16.97	4	0.677966
4	77.8/10.93	34.71	14	2.372881
5	76.88/88.12	37.79	10	1.694915



Scan line 3/2014 – Rioliti di Nuraxi (NUR)

Depositi piroclastici di flusso densamente saldati, con marcata foliazione, a composizione riolitica. La scan line ha direzione N80W e una lunghezza di 5.52 metri.

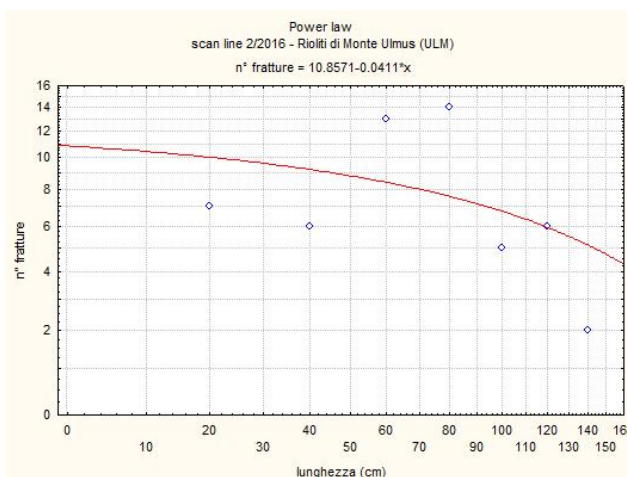
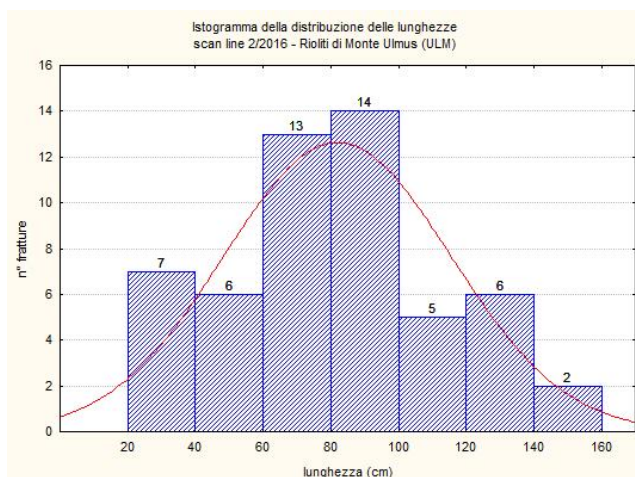
n° set	MRO	k Fisher	n° fratture	P32
1	75.63/257.28	34.59	19	3.442029
2	67.42/280.25	29.46	23	4.166667
3	79.62/98.83	18.7	4	0.724638
4	85.13/139.00	129.1	7	1.268116



### Scan line 2/2016 – Rioliti iperalcaline di Monte Ulmus (ULM)

Depositi piroclastici di flusso, in genere da incipientemente a densamente saldati, con evidenti strutture di flusso nella parte bassa, a composizione riolitica iperalcalina. La scan line ha direzione N84E e una lunghezza di 10.13 metri.

n° set	MRO	k Fisher	n° fratture	P32
1	79.39/306.56	29.08	11	1.085884
2	81.18/100.80	59.36	20	1.974334
3	83.24/251.96	30.32	5	0.493583
4	82.55/131.69	42.43	19	1.875617

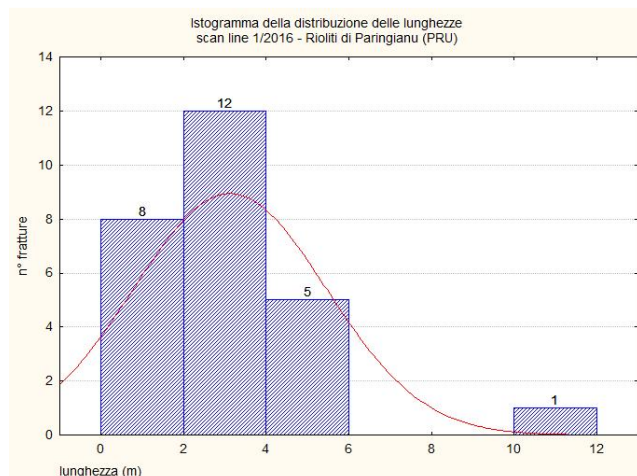


### Scan line 1/2016 – Rioliti di Paringianu (PRU)

Depositi piroclastici (tufi e tufi a lapilli) sia di caduta che di flusso, non saldati, talora litificati, a composizione riolitica. La scan line ha direzione N35E e una lunghezza di 20.6 metri.

n° set	MRO	k Fisher	n° fratture	P32
1	79.33/40.52	40.63	8	0.38835

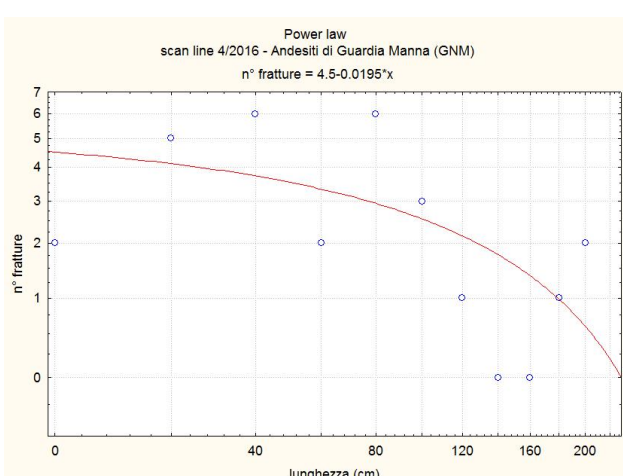
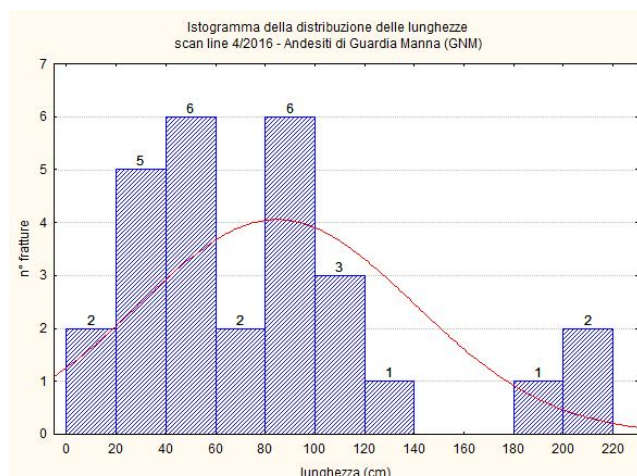
2	80.66/230.40	28.84	9	0.436893
3	85.45/102.75	62.5	5	0.242718
4	77.29/274.60	29.6	3	0.145631



#### Scan line 4/2016 – Andesiti di Guardia Manna (GNM)

Lave andesitiche in ammassi domici con strutture di flusso sub-verticali, in colate massive con laminazioni di flusso e inclusi microcristallini e brecce laviche autoclastiche. La scan line ha direzione N80W e ha una lunghezza di 6.5 metri.

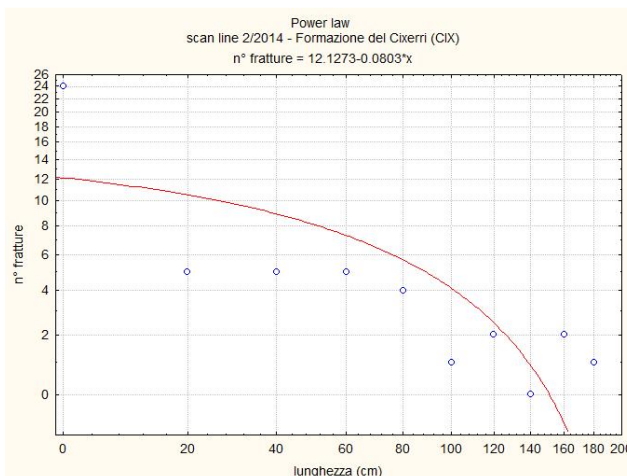
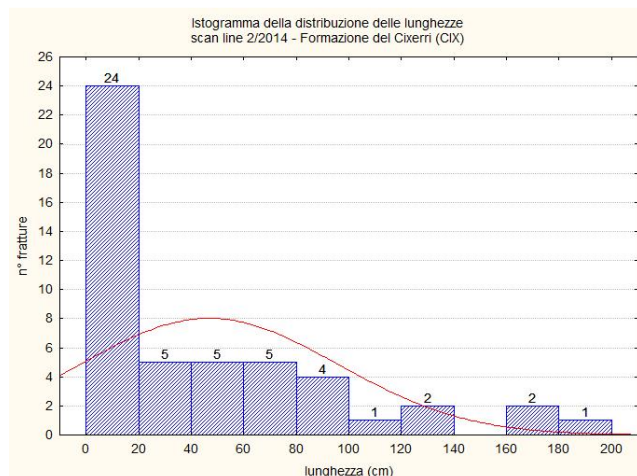
n° set	MRO	k Fisher	n° fratture	P32
1	88.98/305.80	46.03	12	1.846154
2	88.09/132.77	13.65	6	0.923077
3	88.98/234.41	56.91	10	1.538462



#### Scan line 2/2014 – Formazione del Cixerri (CIX)

Arenarie quarzose e quarzoso-feldspatiche, marne, argille siltose e conglomerati di ambiente alluvionale; localmente, alla base, arenarie giallastre a grana media e grossolana. La scan line è stata misurata su uno strato arenaceo per una lunghezza di 8 metri.

n° set	MRO	k Fisher	n° fratture	P32
1	70.13/219.85	42.36	7	0.875
2	84.74/250.80	38.77	8	1
3	75.76/28.19	42.95	12	1.5
4	80.28/69.38	30.93	15	1.875
5	78.14/305.56	20.5	4	0.5

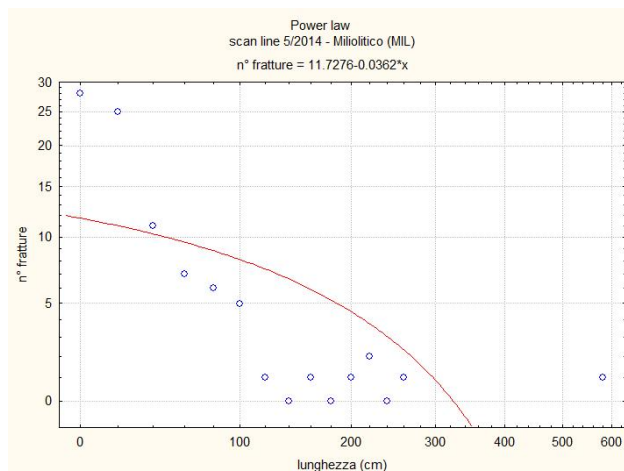
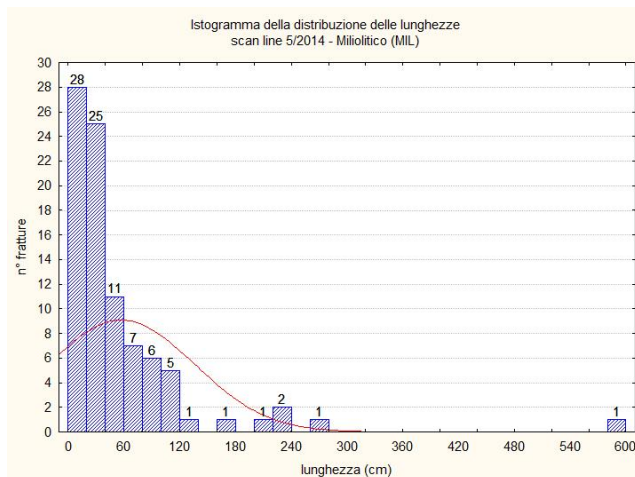


#### Scan line 5/2014 – Miliolitico (MIL)

Calcari e calcari arenacei, spesso ricchissimi di miliolidi di ambiente lagunare. Alla base conglomerati poligenici a prevalenti clasti di quarzo e liliti, verso l'alto arenarie quarzose a cemento carbonatico. La scan line ha una lunghezza di 4 metri ed è orientata N15W.

n° set	MRO	k Fisher	n° fratture	P32
1	71.6/345.04	18.26	23	5.75
2	60.5/300.88	16.23	21	5.25
3	66.9/205.28	14.74	33	8.25
4	68.96/98.86	17.64	12	3

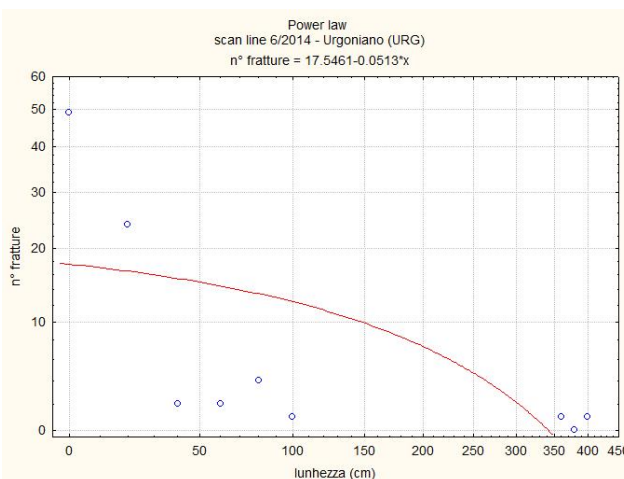
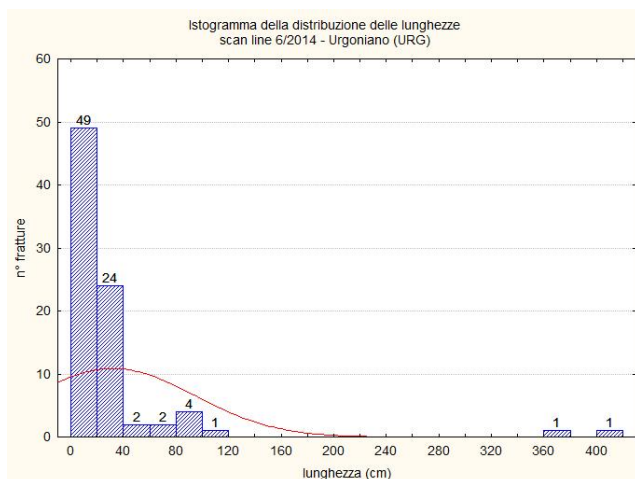




### Scan line 6/2014 – Urganiano (URG)

Calcari (grainstone e/o packstone), calcari marnosi e marne di colore giallo-crema, fossiliferi. La scan line è lunga 2 metri e orientata N8W.

n° set	MRO	k Fisher	n° fratture	P32
1	59.4/241.16	19.21	13	6.5
2	72.06/279.01	30.86	20	10
3	58.43/98.7	20.49	17	8.5
4	65.96/42.35	21.27	34	17

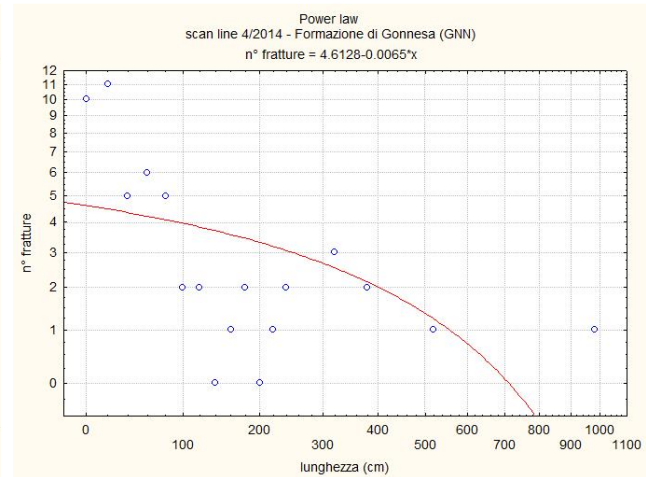
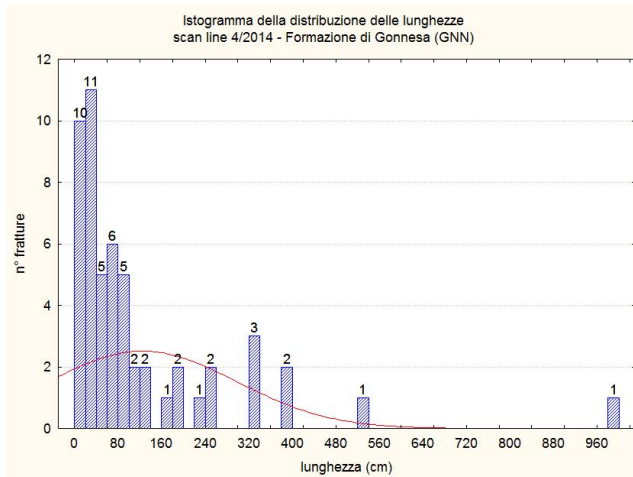


### Scan line 4/2014 – Formazione di Gonnesa (GNN)

Dolomie grigio chiare ben stratificate e laminate, spesso con laminazioni stromatolitiche, con noduli e livelli di selce scura alla base. La scan line è lunga 7.5 metri e ha una direzione N20E.

n° set	MRO	k Fisher	n° fratture	P32
1	79.7/13.08	13.94	22	2.933333

2	36.08/104.09	6.02	6	0.8
3	83.65/195.86	54.18	10	1.333333
4	40.44/278.78	13.92	16	2.133333



## Risultati dei DFN

DFN 1 – Ignimbriti/rioliti – CNM - scan line 1/2014 (lunghezza 50-100 m; apertura media 0,5 mm)

### Session Summary

Fracture Modelling\_ignimbriti - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0136 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 50.0 m

Length Param2: 100.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 69.8000

Orientation Param1: 77.20 deg

Orientation Param2: 277.77 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.06 mm

Number of Fractures: 902

Fracture Modelling\_ignimbriti - Set 2

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0169 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 50.0 m

Length Param2: 100.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 27.1800

Orientation Param1: 73.84 deg

Orientation Param2: 260.03 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.06 mm

Number of Fractures: 1099

Fracture Modelling\_ignimbriti - Set 3

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0068 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 50.0 m

Length Param2: 100.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 16.9700

Orientation Param1: 63.45 deg

Orientation Param2: 172.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.06 mm

Number of Fractures: 463

Fracture Modelling\_ignimbriti - Set 4

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0237 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 50.0 m

Length Param2: 100.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 34.7100

Orientation Param1: 77.80 deg

Orientation Param2: 10.93 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.06 mm

Number of Fractures: 1601

Fracture Modelling\_ignimbriti - Set 5

Input Parameters:





Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 50.0 m  
Length Param2: 100.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 37.7900  
Orientation Param1: 76.88 deg  
Orientation Param2: 88.12 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.06 mm  
Number of Fractures: 1099  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.000662714
Frac_Session1_Permability	0	14.2719
Frac_Session1_Perm_KXX	0	6.56814
Frac_Session1_Perm_KYY	0	10.5915
Frac_Session1_Perm_KZZ	0	13.7587
Frac_Session1_Perm_KXY	-2.25043	1.55495
Frac_Session1_Perm_KXZ	-1.33523	1.79332
Frac_Session1_Perm_KYZ	-1.40308	1.36815
Frac_Session1_Anisotropy	1.29867	100
Frac_Session1_Perm_KB_Max	3.18519e-25	13.556
Frac_Session1_Perm_KB_Min	0	5.58069
Frac_Session1_2D_Anisotropy	1.03281	100
Frac_Session1_P32	0	1.30625

Total Fracture Area: 1.42039e+07 (metre-squared)  
Total Fracture Volume: 7368.06 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 3.68403e-05  
Average Aperture: 0.000518737 (metre)  
Average DFN P32: 0.0710193 (1/metre)  
Run Time : 791.59 (sec)

DFN 2 – Ignimbriti/rioliti – CNM - scan line 1/2014 (lunghezza 1-50 m; apertura media 0,5 mm)

#### Session Summary

Fracture Modelling\_ignimbriti - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0136 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 50.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 69.8000  
Orientation Param1: 77.20 deg  
Orientation Param2: 277.77 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.10 mm  
Number of Fractures: 6466  
Fracture Modelling\_ignimbriti - Set 2  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 27.1800  
Orientation Param1: 73.84 deg  
Orientation Param2: 260.03 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.10 mm  
Number of Fractures: 8055  
Fracture Modelling\_ignimbriti - Set 3  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0068 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 16.9700  
Orientation Param1: 63.45 deg  
Orientation Param2: 172.80 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.10 mm  
Number of Fractures: 3172  
Fracture Modelling\_ignimbriti - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0237 m<sup>2</sup>/m<sup>3</sup>

P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 34.7100  
Orientation Param1: 77.80 deg  
Orientation Param2: 10.93 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.10 mm  
Number of Fractures: 11297  
Fracture Modelling\_ignimbriti - Set 5  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 37.7900  
Orientation Param1: 76.88 deg  
Orientation Param2: 88.12 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.10 mm  
Number of Fractures: 8055  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.000688003
Frac_Session1_Permeability	0	22.1484
Frac_Session1_Perm_KXX	0	11.4148
Frac_Session1_Perm_KYY	0	19.9179
Frac_Session1_Perm_KZZ	0	21.8917
Frac_Session1_Perm_KXY	-4.70062	4.23659
Frac_Session1_Perm_KXZ	-1.92631	3.18495
Frac_Session1_Perm_KYZ	-2.94711	2.92798
Frac_Session1_Anisotropy	1.28289	100
Frac_Session1_Perm_KB_Max	6.58726e-25	21.7719
Frac_Session1_Perm_KB_Min	0	9.64321
Frac_Session1_2D_Anisotropy	1.00679	100
Frac_Session1_P32	0	1.11926

Total Fracture Area: 1.4979e+07 (metre-squared)  
Total Fracture Volume: 9461.28 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)

Average Fracture Porosity: 4.73064e-05  
Average Aperture: 0.000631638 (metre)  
Average DFN P32: 0.0748948 (1/metre)  
Run Time : 827.808 (sec)

DFN 3 – Ignimbriti/rioliti – CNM - scan line 1/2014 (lunghezza 1-10 m; apertura media 0,5 mm)

#### Session Summary

##### Fracture Modelling\_ignimbriti - Set 1

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0136 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 69.8000

Orientation Param1: 77.20 deg

Orientation Param2: 277.77 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm

Number of Fractures: 147587

##### Fracture Modelling\_ignimbriti - Set 2

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 27.1800

Orientation Param1: 73.84 deg

Orientation Param2: 260.03 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm

Number of Fractures: 184366

##### Fracture Modelling\_ignimbriti - Set 3

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0068 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 16.9700  
Orientation Param1: 63.45 deg  
Orientation Param2: 172.80 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm  
Number of Fractures: 74123  
Fracture Modelling\_ignimbriti - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0237 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 34.7100  
Orientation Param1: 77.80 deg  
Orientation Param2: 10.93 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm  
Number of Fractures: 258448  
Fracture Modelling\_ignimbriti - Set 5  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 37.7900  
Orientation Param1: 76.88 deg  
Orientation Param2: 88.12 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm  
Number of Fractures: 184366  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	1.11542e-07	0.000196992



Frac_Session1_Permeability	0.000461125	6.43654
Frac_Session1_Perm_KXX	0.000410568	3.70704
Frac_Session1_Perm_KYY	1.8653e-06	5.31682
Frac_Session1_Perm_KZZ	0.000428391	6.37635
Frac_Session1_Perm_KXY	-1.54464	1.12162
Frac_Session1_Perm_KXZ	-0.534326	0.674855
Frac_Session1_Perm_KYZ	-0.946594	0.796551
Frac_Session1_Anisotropy	1.15493	100
Frac_Session1_Perm_KB_Max	6.05765e-07	6.42601
Frac_Session1_Perm_KB_Min	0	3.3136
Frac_Session1_2D_Anisotropy	1.01087	100
Frac_Session1_P32	0.000453659	0.306777

Total Fracture Area: 1.54802e+07 (metre-squared)  
Total Fracture Volume: 9259.14 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 4.62957e-05  
Average Aperture: 0.000598129 (metre)  
Average DFN P32: 0.0774008 (1/metre)  
Run Time : 2680.9 (sec)

#### DFN 4 – Ignimbriti/rioliti – CNM - scan line 1/2014 (lunghezza 1-10 m; apertura media 1 mm)

##### Session Summary

##### Fracture Modelling\_ignimbriti - Set 1

##### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0136 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 69.8000

Orientation Param1: 77.20 deg

Orientation Param2: 277.77 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 147587

##### Fracture Modelling\_ignimbriti - Set 2

##### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m



Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 27.1800  
Orientation Param1: 73.84 deg  
Orientation Param2: 260.03 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
Number of Fractures: 184366  
Fracture Modelling\_ignimbriti - Set 3  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0068 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 16.9700  
Orientation Param1: 63.45 deg  
Orientation Param2: 172.80 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
Number of Fractures: 74123  
Fracture Modelling\_ignimbriti - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0237 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 34.7100  
Orientation Param1: 77.80 deg  
Orientation Param2: 10.93 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
Number of Fractures: 258448  
Fracture Modelling\_ignimbriti - Set 5  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 37.7900

Orientation Param1: 76.88 deg

Orientation Param2: 88.12 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 184366

Output Grid: ignimbriti

Generated Properties:	Min Value	Max Value
Frac_Session1_Porosity	2.23085e-07	0.000393984
Frac_Session1_Permeability	0.003689	51.4924
Frac_Session1_Perm_KXX	0.00328454	29.6563
Frac_Session1_Perm_KYY	1.49224e-05	42.5346
Frac_Session1_Perm_KZZ	0.00342713	51.0108
Frac_Session1_Perm_KXY	-12.3572	8.97298
Frac_Session1_Perm_KXZ	-4.27461	5.39884
Frac_Session1_Perm_KYZ	-7.57275	6.37241
Frac_Session1_Anisotropy	1.15493	100
Frac_Session1_Perm_KB_Max	4.84612e-06	51.4081
Frac_Session1_Perm_KB_Min	0	26.5088
Frac_Session1_2D_Anisotropy	1.01087	100
Frac_Session1_P32	0.000453659	0.306777

Total Fracture Area: 1.54802e+07 (metre-squared)

Total Fracture Volume: 18518.3 (metre-cubed)

Total Model Volume: 2e+08 (metre-cubed)

Average Fracture Porosity: 9.25914e-05

Average Aperture: 0.00119626 (metre)

Average DFN P32: 0.0774008 (1/metre)

Run Time : 2833.19 (sec)

DFN 5 – Ignimbriti/rioliti – CNM - scan line 1/2014 (lunghezza 0.1-5 m; apertura media 0.5 mm)

Session Summary

Fracture Modelling\_ignimbriti - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0136 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m

Length Param3: -0.0150

Orientation is Defined:

Distribution Is Fisher:  
Fisher K Param: 69.8000  
Orientation Param1: 77.20 deg  
Orientation Param2: 277.77 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 643158  
Fracture Modelling\_ignimbriti - Set 2  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 27.1800  
Orientation Param1: 73.84 deg  
Orientation Param2: 260.03 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 803740  
Fracture Modelling\_ignimbriti - Set 3  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0068 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 16.9700  
Orientation Param1: 63.45 deg  
Orientation Param2: 172.80 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 321922  
Fracture Modelling\_ignimbriti - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0237 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m

Length Param2: 5.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 34.7100  
Orientation Param1: 77.80 deg  
Orientation Param2: 10.93 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 1125727  
Fracture Modelling\_ignimbriti - Set 5  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0169 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0150  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 37.7900  
Orientation Param1: 76.88 deg  
Orientation Param2: 88.12 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 803740  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	1.13783e-05	0.000241402
Frac_Session1_Permeability	0.960527	36.0463
Frac_Session1_Perm_KXX	0.144185	19.7616
Frac_Session1_Perm_KYY	0.234439	29.8924
Frac_Session1_Perm_KZZ	0.951747	35.8599
Frac_Session1_Perm_KXY	-7.91509	3.65315
Frac_Session1_Perm_KXZ	-1.59353	3.1184
Frac_Session1_Perm_KYZ	-4.01429	2.98393
Frac_Session1_Anisotropy	1.18745	18.6584
Frac_Session1_Perm_KB_Max	0.95032	35.7905
Frac_Session1_Perm_KB_Min	0.133619	17.1081
Frac_Session1_2D_Anisotropy	1.13747	18.3176
Frac_Session1_P32	0.012134	0.177176

Total Fracture Area: 1.55255e+07 (metre-squared)  
Total Fracture Volume: 19666.4 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 9.8332e-05  
Average Aperture: 0.00126672 (metre)  
Average DFN P32: 0.0776273 (1/metre)



Run Time : 8255.93 (sec)

DFN 6 – Ignimbriti/rioliti – NUR - scan line 3/2014 (lunghezza 1-10 m; apertura media 0.5 mm)

#### Session Summary

##### Fracture Modelling - Set 1

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0344

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0257

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 34.59

Orientation Param1: 75.63

Orientation Param2: 257.28

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.221182

Number of Fractures: 375866

##### Fracture Modelling - Set 2

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0416667

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0257

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.46

Orientation Param1: 67.42

Orientation Param2: 280.25

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.221182

Number of Fractures: 455074

##### Fracture Modelling - Set 3

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.007246

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10  
Length Param3: -0.0257  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 18.7  
Orientation Param1: 79.62  
Orientation Param2: 98.83  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.221182  
Number of Fractures: 78943  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.01268  
P32: true  
Length Definition is Power Law:  
Length Param1: 1  
Length Param2: 10  
Length Param3: -0.0257  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 129.1  
Orientation Param1: 85.13  
Orientation Param2: 139  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.221182  
Number of Fractures: 138643  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	3.19868e-07	0.000196207
Frac_Session1_Permeability	0.00151675	6.59324
Frac_Session1_Perm_KXX	0.000177839	2.251
Frac_Session1_Perm_KYY	0.00150251	5.96185
Frac_Session1_Perm_KZZ	0.00129261	6.42205
Frac_Session1_Perm_KXY	-0.885658	1.62576
Frac_Session1_Perm_KXZ	-0.552374	1.7926
Frac_Session1_Perm_KYZ	-0.60774	0.62105
Frac_Session1_Anisotropy	1.92203	100
Frac_Session1_Perm_KB_Max	0.00151004	6.48864
Frac_Session1_Perm_KB_Min	2.90812e-05	2.13084
Frac_Session1_2D_Anisotropy	1.32956	100
Frac_Session1_P32	0.00134858	0.304405

Total Fracture Area: 1.90779e+07 (meter-squared)  
Total Fracture Volume: 11431.7 (meter-cubed)  
Total Model Volume: 2e+08 (meter-cubed)  
Average Fracture Porosity: 5.71587e-05  
Average Aperture: 0.000599213 (meter)  
Average DFN P32: 0.0953896 (1/meter)

Run Time : 3118.15 (sec)

DFN 7 – Ignimbriti/rioliti – NUR - scan line 3/2014 (lunghezza 1-10 m; apertura media 1 mm)

#### Session Summary

##### Fracture Modelling - Set 1

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0344

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0257

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 34.59

Orientation Param1: 75.63

Orientation Param2: 257.28

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.442363

Number of Fractures: 375866

##### Fracture Modelling - Set 2

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0416667

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0257

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.46

Orientation Param1: 67.42

Orientation Param2: 280.25

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.442363

Number of Fractures: 455074

##### Fracture Modelling - Set 3

###### Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.007246

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0257  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 18.7  
Orientation Param1: 79.62  
Orientation Param2: 98.83  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.442363  
Number of Fractures: 78943  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.01268  
P32: true  
Length Definition is Power Law:  
Length Param1: 1  
Length Param2: 10  
Length Param3: -0.0257  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 129.1  
Orientation Param1: 85.13  
Orientation Param2: 139  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.442363  
Number of Fractures: 138643  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	6.39736e-07	0.000392413
Frac_Session1_Permeability	0.012134	52.7459
Frac_Session1_Perm_KXX	0.00142271	18.008
Frac_Session1_Perm_KYY	0.0120201	47.6948
Frac_Session1_Perm_KZZ	0.0103409	51.3764
Frac_Session1_Perm_KXY	-7.08526	13.0061
Frac_Session1_Perm_KXZ	-4.41899	14.3408
Frac_Session1_Perm_KYZ	-4.86192	4.9684
Frac_Session1_Anisotropy	1.92203	100
Frac_Session1_Perm_KB_Max	0.0120803	51.9091
Frac_Session1_Perm_KB_Min	0.00023265	17.0467
Frac_Session1_2D_Anisotropy	1.32956	100
Frac_Session1_P32	0.00134858	0.304405

Total Fracture Area: 1.90779e+07 (meter-squared)  
Total Fracture Volume: 22863.5 (meter-cubed)  
Total Model Volume: 2e+08 (meter-cubed)  
Average Fracture Porosity: 0.000114317  
Average Aperture: 0.00119843 (meter)  
Average DFN P32: 0.0953896 (1/meter)  
Run Time : 3117.39 (sec)

DFN 8 – Ignimbriti/rioliti – NUR - scan line 3/2014 (lunghezza 0.1-5 m; apertura media 0.5 mm)

Session Summary

Fracture Modelling - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0344

P32: true

Length Definition is Power Law:

Length Param1: 0.1

Length Param2: 5

Length Param3: -0.0257

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 34.59

Orientation Param1: 75.63

Orientation Param2: 257.28

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.331729

Number of Fractures: 1641601

Fracture Modelling - Set 2

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0416667

P32: true

Length Definition is Power Law:

Length Param1: 0.1

Length Param2: 5

Length Param3: -0.0257

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.46

Orientation Param1: 67.42

Orientation Param2: 280.25

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.331729

Number of Fractures: 1988518

Fracture Modelling - Set 3

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.007246

P32: true

Length Definition is Power Law:

Length Param1: 0.1

Length Param2: 5

Length Param3: -0.0257

Orientation is Defined:





Distribution Is Fisher:  
Fisher K Param: 18.7  
Orientation Param1: 79.62  
Orientation Param2: 98.83  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.331729  
Number of Fractures: 346048  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.01268  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1  
Length Param2: 5  
Length Param3: -0.0257  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 129.1  
Orientation Param1: 85.13  
Orientation Param2: 139  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.331729  
Number of Fractures: 605139  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	1.49602e-05	0.000119382
Frac_Session1_Permeability	0.360415	4.48873
Frac_Session1_Perm_KXX	0.0674262	1.57029
Frac_Session1_Perm_KYY	0.331546	4.40109
Frac_Session1_Perm_KZZ	0.340902	4.31511
Frac_Session1_Perm_KXY	-0.44761	0.891655
Frac_Session1_Perm_KXZ	-0.240763	1.29003
Frac_Session1_Perm_KYZ	-0.287478	0.287347
Frac_Session1_Anisotropy	2.34177	29.4019
Frac_Session1_Perm_KB_Max	0.359375	4.44076
Frac_Session1_Perm_KB_Min	0.0337523	1.25334
Frac_Session1_2D_Anisotropy	1.87908	26.2003
Frac_Session1_P32	0.0291834	0.180615

Total Fracture Area: 1.91263e+07 (meter-squared)  
Total Fracture Volume: 12145.8 (meter-cubed)  
Total Model Volume: 2e+08 (meter-cubed)  
Average Fracture Porosity: 6.07292e-05  
Average Aperture: 0.000635034 (meter)  
Average DFN P32: 0.0956315 (1/meter)  
Run Time : 8783.92 (sec)

DFN 9 – Ignimbriti/rioliti – ULM - scan line 2/2016 (lunghezza 1-10 m; apertura media 0.5 mm)

Session Summary

Fracture Modelling - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0108 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.0800

Orientation Param1: 79.39 deg

Orientation Param2: 306.56 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm

Number of Fractures: 118671

Fracture Modelling - Set 2

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0197 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 59.3600

Orientation Param1: 81.18 deg

Orientation Param2: 100.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm

Number of Fractures: 216506

Fracture Modelling - Set 3

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0049 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 30.3200  
Orientation Param1: 83.24 deg  
Orientation Param2: 251.96 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm  
Number of Fractures: 53584  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0187 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0411  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 42.4300  
Orientation Param1: 82.55 deg  
Orientation Param2: 131.69 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm  
Number of Fractures: 205429  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	8.14614e-08	0.000141798
Frac_Session1_Permeability	0.000420875	5.13243
Frac_Session1_Perm_KXX	0.000149893	2.66427
Frac_Session1_Perm_KYY	0.000292217	4.19355
Frac_Session1_Perm_KZZ	0.00039964	5.00881
Frac_Session1_Perm_KXY	-0.560883	1.81592
Frac_Session1_Perm_KXZ	-0.778913	0.756326
Frac_Session1_Perm_KYZ	-0.479935	0.514172
Frac_Session1_Anisotropy	1.82958	100
Frac_Session1_Perm_KB_Max	1.31611e-05	5.04505
Frac_Session1_Perm_KB_Min	5.68802e-08	1.5485
Frac_Session1_2D_Anisotropy	1.64905	100
Frac_Session1_P32	0.000329789	0.225279

Total Fracture Area: 1.07285e+07 (metre-squared)  
Total Fracture Volume: 6436.63 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 3.21831e-05  
Average Aperture: 0.000599958 (metre)  
Average DFN P32: 0.0536423 (1/metre)  
Run Time : 2189.72 (sec)

DFN 10 – Ignimbriti/rioliti – ULM - scan line 2/2016 (lunghezza 1-10 m; apertura media 1 mm)

## Session Summary

### Fracture Modelling - Set 1

#### Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0108 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.0800

Orientation Param1: 79.39 deg

Orientation Param2: 306.56 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 118671

### Fracture Modelling - Set 2

#### Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0197 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 59.3600

Orientation Param1: 81.18 deg

Orientation Param2: 100.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 216506

### Fracture Modelling - Set 3

#### Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0049 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 30.3200

Orientation Param1: 83.24 deg

Orientation Param2: 251.96 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
Number of Fractures: 53584  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0187 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0411  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 42.4300  
Orientation Param1: 82.55 deg  
Orientation Param2: 131.69 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
Number of Fractures: 205429  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	1.62923e-07	0.000283595
Frac_Session1_Permeability	0.003367	41.0594
Frac_Session1_Perm_KXX	0.00119914	21.3142
Frac_Session1_Perm_KYY	0.00233774	33.5484
Frac_Session1_Perm_KZZ	0.00319712	40.0705
Frac_Session1_Perm_KXY	-4.48707	14.5274
Frac_Session1_Perm_KXZ	-6.2313	6.05061
Frac_Session1_Perm_KYZ	-3.83948	4.11337
Frac_Session1_Anisotropy	1.82958	100
Frac_Session1_Perm_KB_Max	0.000105289	40.3604
Frac_Session1_Perm_KB_Min	4.55041e-07	12.388
Frac_Session1_2D_Anisotropy	1.64905	100
Frac_Session1_P32	0.000329789	0.225279

Total Fracture Area: 1.07285e+07 (metre-squared)  
Total Fracture Volume: 12873.3 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 6.43663e-05  
Average Aperture: 0.00119992 (metre)  
Average DFN P32: 0.0536423 (1/metre)  
Run Time : 2219.56 (sec)

DFN 11 – Ignimbriti/rioliti – ULM - scan line 2/2016 (lunghezza 0.1-5 m; apertura media 0.5 mm)

#### Session Summary



#### Fracture Modelling - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0108 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.0800

Orientation Param1: 79.39 deg

Orientation Param2: 306.56 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.33 mm

Number of Fractures: 520194

#### Fracture Modelling - Set 2

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0197 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 59.3600

Orientation Param1: 81.18 deg

Orientation Param2: 100.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.33 mm

Number of Fractures: 948817

#### Fracture Modelling - Set 3

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0049 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m

Length Param3: -0.0411

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 30.3200

Orientation Param1: 83.24 deg

Orientation Param2: 251.96 deg

Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.33 mm  
Number of Fractures: 235783  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0187 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0411  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 42.4300  
Orientation Param1: 82.55 deg  
Orientation Param2: 131.69 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.33 mm  
Number of Fractures: 900784  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	4.40317e-06	8.73916e-05
Frac_Session1_Permability	0.0767501	3.50708
Frac_Session1_Perm_KXX	0.0152536	1.26839
Frac_Session1_Perm_KYY	0.0590144	2.8029
Frac_Session1_Perm_KZZ	0.0764975	3.4739
Frac_Session1_Perm_KXY	-0.124856	1.29885
Frac_Session1_Perm_KXZ	-0.462586	0.34893
Frac_Session1_Perm_KYZ	-0.293363	0.307027
Frac_Session1_Anisotropy	1.74142	81.1034
Frac_Session1_Perm_KB_Max	0.0763391	3.44562
Frac_Session1_Perm_KB_Min	0.00514658	0.87507
Frac_Session1_2D_Anisotropy	1.70009	62.0772
Frac_Session1_P32	0.0100328	0.127713

Total Fracture Area: 1.0764e+07 (metre-squared)  
Total Fracture Volume: 6857.48 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 3.42874e-05  
Average Aperture: 0.000637075 (metre)  
Average DFN P32: 0.0538201 (1/metre)  
Run Time : 5774.62 (sec)

DFN 12 – Ignimbriti/rioliti – PRU - scan line 1/2016 (lunghezza 1-10 m; apertura media 1 mm)

Session Summary  
Fracture Modelling - Set 1

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0039 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -1.0857

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 40.6300

Orientation Param1: 79.33 deg

Orientation Param2: 40.52 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.54 mm

Number of Fractures: 77416

Fracture Modelling - Set 2

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0044 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -1.0857

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 28.8400

Orientation Param1: 80.66 deg

Orientation Param2: 230.40 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.54 mm

Number of Fractures: 87118

Fracture Modelling - Set 3

Input Parameters:

Input Grid: ignimbriti

Intensity Value:  $0.0024 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -1.0857

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 62.5000

Orientation Param1: 85.45 deg

Orientation Param2: 102.75 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.54 mm

Number of Fractures: 48546

Fracture Modelling - Set 4

Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0015 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -1.0857

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.6000

Orientation Param1: 77.29 deg

Orientation Param2: 274.60 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.54 mm

Number of Fractures: 28989

Output Grid: ignimbriti

Generated Properties:	Min Value	Max Value
Frac_Session1_Porosity	0	0.000250893
Frac_Session1_Permeability	0	53.6856
Frac_Session1_Perm_KXX	0	26.4926
Frac_Session1_Perm_KYY	0	49.3453
Frac_Session1_Perm_KZZ	0	51.1519
Frac_Session1_Perm_KXY	-19.2143	8.51936
Frac_Session1_Perm_KXZ	-9.04894	11.0397
Frac_Session1_Perm_KYZ	-7.79266	7.37227
Frac_Session1_Anisotropy	1.98176	100
Frac_Session1_Perm_KB_Max	3.59819e-08	51.0696
Frac_Session1_Perm_KB_Min	0	16.4411
Frac_Session1_2D_Anisotropy	1.32481	100
Frac_Session1_P32	0	0.151929

Total Fracture Area: 2.39923e+06 (metre-squared)

Total Fracture Volume: 3285.19 (metre-cubed)

Total Model Volume: 2e+08 (metre-cubed)

Average Fracture Porosity: 1.64259e-05

Average Aperture: 0.00136927 (metre)

Average DFN P32: 0.0119962 (1/metre)

Run Time : 730.883 (sec)

DFN 13 – Ignimbriti/rioliti – PRU - scan line 1/2016 (lunghezza 1-10 m; apertura media 0.5 mm)

Session Summary

Fracture Modelling - Set 1

Input Parameters:

Input Grid: ignimbriti  
Intensity Value: 0.0039 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 40.6300  
Orientation Param1: 79.33 deg  
Orientation Param2: 40.52 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 2.72 mm  
Number of Fractures: 77416  
Fracture Modelling - Set 2  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0044 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 28.8400  
Orientation Param1: 80.66 deg  
Orientation Param2: 230.40 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 2.72 mm  
Number of Fractures: 87118  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0024 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 62.5000  
Orientation Param1: 85.45 deg  
Orientation Param2: 102.75 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 2.72 mm

Number of Fractures: 48546  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0015 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 29.6000  
Orientation Param1: 77.29 deg  
Orientation Param2: 274.60 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 2.72 mm  
Number of Fractures: 28989  
Output Grid: ignimbriti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.00125446
Frac_Session1_Permability	0	6710.71
Frac_Session1_Perm_KXX	0	3311.58
Frac_Session1_Perm_KYY	0	6168.16
Frac_Session1_Perm_KZZ	0	6393.98
Frac_Session1_Perm_KXY	-2401.79	1064.92
Frac_Session1_Perm_KXZ	-1131.12	1379.97
Frac_Session1_Perm_KYZ	-974.083	921.534
Frac_Session1_Anisotropy	1.98176	100
Frac_Session1_Perm_KB_Max	2.03653e-06	6383.7
Frac_Session1_Perm_KB_Min	0	2055.14
Frac_Session1_2D_Anisotropy	1.32481	100
Frac_Session1_P32	0	0.151929

Total Fracture Area: 2.39923e+06 (metre-squared)  
Total Fracture Volume: 16425.9 (metre-cubed)  
Total Model Volume: 2e+08 (metre-cubed)  
Average Fracture Porosity: 8.21297e-05  
Average Aperture: 0.00684633 (metre)  
Average DFN P32: 0.0119962 (1/metre)  
Run Time : 703.815 (sec)

DFN 14 – Ignimbriti/rioliti – PRU - scan line 1/2016 (lunghezza 0.1-5 m; apertura media 0.5 mm)

Session Summary  
Fracture Modelling - Set 1  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value: 0.0039 m<sup>2</sup>/m<sup>3</sup>

P32: true  
Length Definition is Power Law:  
Length Param1: 5.0 m  
Length Param2: 50.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 40.6300  
Orientation Param1: 79.33 deg  
Orientation Param2: 40.52 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 1.21 mm  
Number of Fractures: 3066  
Fracture Modelling - Set 2  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value:  $0.0044 \text{ m}^2/\text{m}^3$   
P32: true  
Length Definition is Power Law:  
Length Param1: 5.0 m  
Length Param2: 50.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 28.8400  
Orientation Param1: 80.66 deg  
Orientation Param2: 230.40 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 1.21 mm  
Number of Fractures: 3476  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: ignimbriti  
Intensity Value:  $0.0024 \text{ m}^2/\text{m}^3$   
P32: true  
Length Definition is Power Law:  
Length Param1: 5.0 m  
Length Param2: 50.0 m  
Length Param3: -1.0857  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 62.5000  
Orientation Param1: 85.45 deg  
Orientation Param2: 102.75 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 1.21 mm  
Number of Fractures: 1890  
Fracture Modelling - Set 4



Input Parameters:

Input Grid: ignimbriti

Intensity Value: 0.0015 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 5.0 m

Length Param2: 50.0 m

Length Param3: -1.0857

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 29.6000

Orientation Param1: 77.29 deg

Orientation Param2: 274.60 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 1.21 mm

Number of Fractures: 1098

Output Grid: ignimbriti

Generated Properties:	Min Value	Max Value
Frac_Session1_Porosity	0	0.00369678
Frac_Session1_Perm_KXX	0	16838.9
Frac_Session1_Perm_KYY	0	8847.72
Frac_Session1_Perm_KZZ	0	13513.6
Frac_Session1_Perm_KXY	0	16291.5
Frac_Session1_Perm_KXZ	-7287.92	2414.21
Frac_Session1_Perm_KYZ	-2199.31	3339.67
Frac_Session1_Perm_KYZ	-2379.1	2224.95
Frac_Session1_Anisotropy	2.06475	100
Frac_Session1_Perm_KB_Max	7.9821e-22	16271.5
Frac_Session1_Perm_KB_Min	0	5124.2
Frac_Session1_2D_Anisotropy	1.57099	100
Frac_Session1_P32	0	0.579331

Total Fracture Area: 2.29956e+06 (metre-squared)

Total Fracture Volume: 15680 (metre-cubed)

Total Model Volume: 2e+08 (metre-cubed)

Average Fracture Porosity: 7.84001e-05

Average Aperture: 0.00681871 (metre)

Average DFN P32: 0.0114978 (1/metre)

Run Time : 171.912 (sec)

DFN 15 – Andesiti – GMN - scan line 4/2016 (lunghezza 1-50 m; apertura media 1 mm)

Session Summary

Fracture Modelling - Set 1

Input Parameters:

Input Grid: andesiti

Intensity Value: 0.0184 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:



Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0195  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 46.0300  
Orientation Param1: 88.98 deg  
Orientation Param2: 305.80 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.21 mm  
Number of Fractures: 8751  
Fracture Modelling - Set 2  
Input Parameters:  
Input Grid: andesiti  
Intensity Value: 0.0092 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0195  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 13.6500  
Orientation Param1: 88.09 deg  
Orientation Param2: 132.77 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.21 mm  
Number of Fractures: 4417  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: andesiti  
Intensity Value: 0.0154 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 50.0 m  
Length Param3: -0.0195  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 56.9100  
Orientation Param1: 88.98 deg  
Orientation Param2: 234.41 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.21 mm  
Number of Fractures: 7299  
Output Grid: andesiti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.000897983

Frac_Session1_Permeability	0	143.096
Frac_Session1_Perm_KXX	0	77.3331
Frac_Session1_Perm_KYY	0	108.364
Frac_Session1_Perm_KZZ	0	142.21
Frac_Session1_Perm_KXY	-46.8444	45.0523
Frac_Session1_Perm_KXZ	-19.1205	23.6008
Frac_Session1_Perm_KYZ	-20.4898	16.7242
Frac_Session1_Anisotropy	1.75535	100
Frac_Session1_Perm_KB_Max	5.75228e-09	141.842
Frac_Session1_Perm_KB_Min	0	50.304
Frac_Session1_2D_Anisotropy	1.47952	100
Frac_Session1_P32	0	0.695397

Total Fracture Area: 8.28064e+06 (metre-squared)  
 Total Fracture Volume: 10485.9 (metre-cubed)  
 Total Model Volume: 1.99747e+08 (metre-cubed)  
 Average Fracture Porosity: 5.24958e-05  
 Average Aperture: 0.00126631 (metre)  
 Average DFN P32: 0.0414557 (1/metre)  
 Run Time : 643.357 (sec)

DFN 16 – Andesiti – GMN - scan line 4/2016 (lunghezza 0.1-5 m; apertura media 1 mm)

#### Session Summary

##### Fracture Modelling - Set 1

##### Input Parameters:

Input Grid: andesiti

Intensity Value: 0.0184 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m

Length Param3: -0.0195

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 46.0300

Orientation Param1: 88.98 deg

Orientation Param2: 305.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm

Number of Fractures: 873420

##### Fracture Modelling - Set 2

##### Input Parameters:

Input Grid: andesiti

Intensity Value: 0.0092 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m  
Length Param3: -0.0195  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 13.6500  
Orientation Param1: 88.09 deg  
Orientation Param2: 132.77 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 436632  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: andesiti  
Intensity Value: 0.0154 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0195  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 56.9100  
Orientation Param1: 88.98 deg  
Orientation Param2: 234.41 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.66 mm  
Number of Fractures: 731000  
Output Grid: andesiti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.000152875
Frac_Session1_Permeability	0	23.2652
Frac_Session1_Perm_KXX	0	10.2929
Frac_Session1_Perm_KYY	0	16.8257
Frac_Session1_Perm_KZZ	0	23.2355
Frac_Session1_Perm_KXY	-3.91839	7.17438
Frac_Session1_Perm_KXZ	-2.45494	2.66265
Frac_Session1_Perm_KYZ	-2.28952	2.36314
Frac_Session1_Anisotropy	1.5579	100
Frac_Session1_Perm_KB_Max	0.00194279	23.1915
Frac_Session1_Perm_KB_Min	0	9.83597
Frac_Session1_2D_Anisotropy	1.48242	100
Frac_Session1_P32	0	0.116279

Total Fracture Area: 8.54254e+06 (metre-squared)  
Total Fracture Volume: 10832 (metre-cubed)  
Total Model Volume: 1.99747e+08 (metre-cubed)  
Average Fracture Porosity: 5.42287e-05  
Average Aperture: 0.00126801 (metre)  
Average DFN P32: 0.0427669 (1/metre)

Run Time : 4914.57 (sec)

DFN 17 – Andesiti – GMN - scan line 4/2016 (lunghezza 1-10 m; apertura media 0.5 mm)

#### Session Summary

##### Fracture Modelling - Set 1

###### Input Parameters:

Input Grid: andesiti

Intensity Value:  $0.0184 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0195

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 46.0300

Orientation Param1: 88.98 deg

Orientation Param2: 305.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm

Number of Fractures: 200247

##### Fracture Modelling - Set 2

###### Input Parameters:

Input Grid: andesiti

Intensity Value:  $0.0092 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0195

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 13.6500

Orientation Param1: 88.09 deg

Orientation Param2: 132.77 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm

Number of Fractures: 99957

##### Fracture Modelling - Set 3

###### Input Parameters:

Input Grid: andesiti

Intensity Value:  $0.0154 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0195  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 56.9100  
Orientation Param1: 88.98 deg  
Orientation Param2: 234.41 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.22 mm  
Number of Fractures: 167700  
Output Grid: andesiti  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.00012181
Frac_Session1_Perm permeability	0	12.0356
Frac_Session1_Perm_KXX	0	4.82629
Frac_Session1_Perm_KYY	0	7.47904
Frac_Session1_Perm_KZZ	0	11.7658
Frac_Session1_Perm_KXY	-5.73143	1.40406
Frac_Session1_Perm_KXZ	-0.725382	1.39457
Frac_Session1_Perm_KYZ	-0.581865	1.10869
Frac_Session1_Anisotropy	1.47861	100
Frac_Session1_Perm_KB_Max	1.25355e-06	33.3924
Frac_Session1_Perm_KB_Min	0	1.87636
Frac_Session1_2D_Anisotropy	1.18227	100
Frac_Session1_P32	0	0.188559

Total Fracture Area: 8.50792e+06 (metre-squared)  
Total Fracture Volume: 5090.7 (metre-cubed)  
Total Model Volume: 1.99747e+08 (metre-cubed)  
Average Fracture Porosity: 2.54858e-05  
Average Aperture: 0.000598349 (metre)  
Average DFN P32: 0.0425935 (1/metre)  
Run Time : 1700.05 (sec)

DFN 18 – Cixerri – CIX - scan line 2/2014 (lunghezza 0.1-5 m; apertura media 1 mm)

Session Summary  
Fracture Modelling - Set 1  
Input Parameters:  
Input Grid: cixerri  
Intensity Value: 0.0088 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0803  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 42.3600

Orientation Param1: 70.13 deg  
Orientation Param2: 219.85 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.67 mm  
Number of Fractures: 499811  
Fracture Modelling - Set 2  
Input Parameters:  
Input Grid: cixerri  
Intensity Value: 0.0100 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0803  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 38.7700  
Orientation Param1: 84.74 deg  
Orientation Param2: 250.80 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.67 mm  
Number of Fractures: 567817  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: cixerri  
Intensity Value: 0.0150 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0803  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 42.9500  
Orientation Param1: 75.76 deg  
Orientation Param2: 28.19 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.67 mm  
Number of Fractures: 851810  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: cixerri  
Intensity Value: 0.0188 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 0.1 m  
Length Param2: 5.0 m  
Length Param3: -0.0803



Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 30.9300

Orientation Param1: 80.28 deg

Orientation Param2: 69.38 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.67 mm

Number of Fractures: 1067391

Fracture Modelling - Set 5

Input Parameters:

Input Grid: cixerri

Intensity Value: 0.0050 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 0.1 m

Length Param2: 5.0 m

Length Param3: -0.0803

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 20.5000

Orientation Param1: 78.14 deg

Orientation Param2: 305.56 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.67 mm

Number of Fractures: 283840

Output Grid: cixerri

Generated Properties:	Min Value	Max Value
Frac_Session1_Porosity	0	0.000347738
Frac_Session1_Permability	0	49.5524
Frac_Session1_Perm_KXX	0	28.5268
Frac_Session1_Perm_KYY	0	28.8341
Frac_Session1_Perm_KZZ	0	49.3562
Frac_Session1_Perm_KXY	-21.0379	3.54485
Frac_Session1_Perm_KXZ	-6.5107	5.99651
Frac_Session1_Perm_KYZ	-7.39383	4.84056
Frac_Session1_Anisotropy	1.57315	100
Frac_Session1_Perm_KB_Max	3.05567e-05	49.0971
Frac_Session1_Perm_KB_Min	0	19.3901
Frac_Session1_2D_Anisotropy	1.4137	100
Frac_Session1_P32	0	0.285466

Total Fracture Area: 1.32365e+07 (metre-squared)

Total Fracture Volume: 17024.5 (metre-cubed)

Total Model Volume: 2.30153e+08 (metre-cubed)

Average Fracture Porosity: 7.39703e-05

Average Aperture: 0.00128618 (metre)

Average DFN P32: 0.0575118 (1/metre)

Run Time : 11303.5 (sec)

DFN 19 – Cixerri – CIX - scan line 2/2014 (lunghezza 1-10 m; apertura media 1 mm)

Session Summary

Fracture Modelling - Set 1

Input Parameters:

Input Grid: cixerri

Intensity Value:  $0.0088 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0803

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 42.3600

Orientation Param1: 70.13 deg

Orientation Param2: 219.85 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.45 mm

Number of Fractures: 112937

Fracture Modelling - Set 2

Input Parameters:

Input Grid: cixerri

Intensity Value:  $0.0100 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0803

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 38.7700

Orientation Param1: 84.74 deg

Orientation Param2: 250.80 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.45 mm

Number of Fractures: 128325

Fracture Modelling - Set 3

Input Parameters:

Input Grid: cixerri

Intensity Value:  $0.0150 \text{ m}^2/\text{m}^3$

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0803

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 42.9500  
Orientation Param1: 75.76 deg  
Orientation Param2: 28.19 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.45 mm  
Number of Fractures: 192743  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: cixerri  
Intensity Value: 0.0188 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0803  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 30.9300  
Orientation Param1: 80.28 deg  
Orientation Param2: 69.38 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.45 mm  
Number of Fractures: 241857  
Fracture Modelling - Set 5  
Input Parameters:  
Input Grid: cixerri  
Intensity Value: 0.0050 m<sup>2</sup>/m<sup>3</sup>  
P32: true  
Length Definition is Power Law:  
Length Param1: 1.0 m  
Length Param2: 10.0 m  
Length Param3: -0.0803  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 20.5000  
Orientation Param1: 78.14 deg  
Orientation Param2: 305.56 deg  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.45 mm  
Number of Fractures: 64060  
Output Grid: cixerri  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.00127346
Frac_Session1_Perm_KYY	0	149.099
Frac_Session1_Perm_KXX	0	77.1091
Frac_Session1_Perm_KYY	0	86.3122
Frac_Session1_Perm_KZZ	0	141.893
Frac_Session1_Perm_KXY	-50.2748	5.96978

Frac_Session1_Perm_KXZ	-8.24317	16.8111
Frac_Session1_Perm_KYZ	-8.2299	21.269
Frac_Session1_Anisotropy	1.49592	100
Frac_Session1_Perm_KB_Max	5.87597e-08	148.953
Frac_Session1_Perm_KB_Min	0	28.5777
Frac_Session1_2D_Anisotropy	1.19402	100
Frac_Session1_P32	0	1.08066

Total Fracture Area: 1.31571e+07 (metre-squared)  
Total Fracture Volume: 15858.2 (metre-cubed)  
Total Model Volume: 2.30153e+08 (metre-cubed)  
Average Fracture Porosity: 6.8903e-05  
Average Aperture: 0.0012053 (metre)  
Average DFN P32: 0.0571668 (1/metre)  
Run Time : 4037.91 (sec)

DFN 20 – Miliolitico – MIL - scan line 5/2014 (lunghezza 1-10 m; apertura media 0.5 mm)

#### Session Summary

##### Fracture Modelling - Set 1

###### Input Parameters:

Input Grid: miliolitico

Intensity Value: 0.0575

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0362

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 18.26

Orientation Param1: 71.6

Orientation Param2: 345.04

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.221541

Number of Fractures: 67722

##### Fracture Modelling - Set 2

###### Input Parameters:

Input Grid: miliolitico

Intensity Value: 0.0525

P32: true

Length Definition is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0362

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 16.23

Orientation Param1: 60.5  
Orientation Param2: 300.88  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.221541  
Number of Fractures: 61804  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: miliolitico  
Intensity Value: 0.0825  
P32: true  
Length Defintion is Power Law:  
Length Param1: 1  
Length Param2: 10  
Length Param3: -0.0362  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 14.74  
Orientation Param1: 66.9  
Orientation Param2: 205.28  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.221541  
Number of Fractures: 97161  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: miliolitico  
Intensity Value: 0.03  
P32: true  
Length Defintion is Power Law:  
Length Param1: 1  
Length Param2: 10  
Length Param3: -0.0362  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 17.64  
Orientation Param1: 68.96  
Orientation Param2: 98.86  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.221541  
Number of Fractures: 35374  
Output Grid: miliolitico  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.000367602
Frac_Session1_Permability	0	10.8354
Frac_Session1_Perm_KXX	0	8.4525
Frac_Session1_Perm_KYY	0	6.41861
Frac_Session1_Perm_KZZ	0	10.4644
Frac_Session1_Perm_KXY	-1.73125	1.85372
Frac_Session1_Perm_KXZ	-1.18172	2.19819

Frac_Session1_Perm_KYZ	-1.78348	2.24844
Frac_Session1_Anisotropy	1.18046	100
Frac_Session1_Perm_KB_Max	0.00147139	9.87432
Frac_Session1_Perm_KB_Min	0	5.67466
Frac_Session1_2D_Anisotropy	1.01402	100
Frac_Session1_P32	0	0.627833

Total Fracture Area: 4.6579e+06 (meter-squared)  
Total Fracture Volume: 2791.01 (meter-cubed)  
Total Model Volume: 2.14101e+07 (meter-cubed)  
Average Fracture Porosity: 0.000130359  
Average Aperture: 0.000599198 (meter)  
Average DFN P32: 0.217556 (1/meter)  
Run Time : 101.758 (sec)

DFN 21 – Miliolitico – MIL - scan line 5/2014 (lunghezza 1-10 m; apertura media 1 mm)

#### Session Summary

##### Fracture Modelling - Set 1

Input Parameters:

Input Grid: miliolitico

Intensity Value: 0.0575

P32: true

Length Defintion is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0362

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 18.26

Orientation Param1: 71.6

Orientation Param2: 345.04

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.443082

Number of Fractures: 67722

##### Fracture Modelling - Set 2

Input Parameters:

Input Grid: miliolitico

Intensity Value: 0.0525

P32: true

Length Defintion is Power Law:

Length Param1: 1

Length Param2: 10

Length Param3: -0.0362

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 16.23

Orientation Param1: 60.5

Orientation Param2: 300.88



Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.443082  
Number of Fractures: 61804  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: miliolitico  
Intensity Value: 0.0825  
P32: true  
Length Defintion is Power Law:  
Length Param1: 1  
Length Param2: 10  
Length Param3: -0.0362  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 14.74  
Orientation Param1: 66.9  
Orientation Param2: 205.28  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.443082  
Number of Fractures: 97161  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: miliolitico  
Intensity Value: 0.03  
P32: true  
Length Defintion is Power Law:  
Length Param1: 1  
Length Param2: 10  
Length Param3: -0.0362  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 17.64  
Orientation Param1: 68.96  
Orientation Param2: 98.86  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.443082  
Number of Fractures: 35374  
Output Grid: miliolitico  
Generated Properties:                      Min Value                      Max Value  
Frac\_Session1\_Porosity                      0                      0.000735204  
Frac\_Session1\_Permeability                      0                      86.6828  
Frac\_Session1\_Perm\_KXX                      0                      67.62  
Frac\_Session1\_Perm\_KYY                      0                      51.3488  
Frac\_Session1\_Perm\_KZZ                      0                      83.7151  
Frac\_Session1\_Perm\_KXY                      -13.85                      14.8298  
Frac\_Session1\_Perm\_KXZ                      -9.45374                      17.5855  
Frac\_Session1\_Perm\_KYZ                      -14.2678                      17.9875  
Frac\_Session1\_Anisotropy                      1.18046                      100



Frac_Session1_Perm_KB_Max	0.0117711	78.9945
Frac_Session1_Perm_KB_Min	0	45.3973
Frac_Session1_2D_Anisotropy	1.01402	100
Frac_Session1_P32	0	0.627833

Total Fracture Area: 4.6579e+06 (meter-squared)  
Total Fracture Volume: 5582.02 (meter-cubed)  
Total Model Volume: 2.14101e+07 (meter-cubed)  
Average Fracture Porosity: 0.000260719  
Average Aperture: 0.0011984 (meter)  
Average DFN P32: 0.217556 (1/meter)  
Run Time : 101.206 (sec)

DFN 22 – Miliolitico – MIL - scan line 5/2014 (lunghezza 0.1-5 m; apertura media 1 mm)

#### Session Summary

##### Fracture Modelling - Set 1

Input Parameters:

Input Grid: miliolitico

Intensity Value: 0.0575

P32: true

Length Definition is Power Law:

Length Param1: 0.1

Length Param2: 5

Length Param3: -0.0362

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 18.26

Orientation Param1: 71.6

Orientation Param2: 345.04

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.665358

Number of Fractures: 296216

##### Fracture Modelling - Set 2

Input Parameters:

Input Grid: miliolitico

Intensity Value: 0.0525

P32: true

Length Definition is Power Law:

Length Param1: 0.1

Length Param2: 5

Length Param3: -0.0362

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 16.23

Orientation Param1: 60.5

Orientation Param2: 300.88

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.665358



Number of Fractures: 270467  
Fracture Modelling - Set 3  
Input Parameters:  
Input Grid: miliolitico  
Intensity Value: 0.0825  
P32: true  
Length Defintion is Power Law:  
Length Param1: 0.1  
Length Param2: 5  
Length Param3: -0.0362  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 14.74  
Orientation Param1: 66.9  
Orientation Param2: 205.28  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.665358  
Number of Fractures: 424987  
Fracture Modelling - Set 4  
Input Parameters:  
Input Grid: miliolitico  
Intensity Value: 0.03  
P32: true  
Length Defintion is Power Law:  
Length Param1: 0.1  
Length Param2: 5  
Length Param3: -0.0362  
Orientation is Defined:  
Distribution Is Fisher:  
Fisher K Param: 17.64  
Orientation Param1: 68.96  
Orientation Param2: 98.86  
Aspect Ratio: 0.5  
Aperture: (Proportional to Root Length) - Coefficient used = 0.665358  
Number of Fractures: 154591  
Output Grid: miliolitico  
Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.00192768
Frac_Session1_Permeability	0	296.079
Frac_Session1_Perm_KXX	0	279.086
Frac_Session1_Perm_KYY	0	260.913
Frac_Session1_Perm_KZZ	0	81.1254
Frac_Session1_Perm_KXY	-20.2184	12.0987
Frac_Session1_Perm_KXZ	-7.48729	63.4471
Frac_Session1_Perm_KYZ	-10.0955	81.983
Frac_Session1_Anisotropy	1.18597	100
Frac_Session1_Perm_KB_Max	0.789588	289.48
Frac_Session1_Perm_KB_Min	0	95.7329

Frac\_Session1\_2D\_Anisotropy      1.05884      100  
Frac\_Session1\_P32      0      1.43252  
Total Fracture Area: 4.6896e+06 (meter-squared)  
Total Fracture Volume: 5963.3 (meter-cubed)  
Total Model Volume: 2.14101e+07 (meter-cubed)  
Average Fracture Porosity: 0.000278527  
Average Aperture: 0.0012716 (meter)  
Average DFN P32: 0.219037 (1/meter)  
Run Time : 279.147 (sec)

DFN 23 – Mesozoico – URG - scan line 6/2014 (lunghezza 1-10 m; apertura media 0.5 mm)

#### Session Summary

##### Fracture Modelling - Set 1

###### Input Parameters:

Input Grid: mesozoico

Intensity Value: 0.0650 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0513

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 19.2100

Orientation Param1: 59.40 deg

Orientation Param2: 241.16 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 1007838

##### Fracture Modelling - Set 2

###### Input Parameters:

Input Grid: mesozoico

Intensity Value: 0.1000 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0513

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 30.8600

Orientation Param1: 72.06 deg

Orientation Param2: 279.01 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 1550542

##### Fracture Modelling - Set 3

Input Parameters:

Input Grid: mesozoico

Intensity Value: 0.0850 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0513

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 20.4900

Orientation Param1: 58.43 deg

Orientation Param2: 98.70 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 1318017

Fracture Modelling - Set 4

Input Parameters:

Input Grid: mesozoico

Intensity Value: 0.1700 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0513

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 21.2700

Orientation Param1: 65.96 deg

Orientation Param2: 42.35 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 2635628

Output Grid: mesozoico

Generated Properties:	Min Value	Max Value
Frac_Session1_Porosity	0	0.00107053
Frac_Session1_Permeability	0	137.329
Frac_Session1_Perm_KXX	0	95.448
Frac_Session1_Perm_KYY	0	123.781
Frac_Session1_Perm_KZZ	0	118.403
Frac_Session1_Perm_KXY	-32.9204	8.76348
Frac_Session1_Perm_KXZ	-25.7001	35.2503
Frac_Session1_Perm_KYZ	-19.6058	15.5281
Frac_Session1_Anisotropy	1.34546	100
Frac_Session1_Perm_KB_Max	0.00661614	125.249
Frac_Session1_Perm_KB_Min	0	74.3607
Frac_Session1_2D_Anisotropy	1.05294	100
Frac_Session1_P32	0	0.871498

Total Fracture Area: 1.17249e+08 (metre-squared)  
Total Fracture Volume: 140901 (metre-cubed)  
Total Model Volume: 2.80804e+08 (metre-cubed)  
Average Fracture Porosity: 0.000501776  
Average Aperture: 0.00120172 (metre)  
Average DFN P32: 0.417548 (1/metre)  
Run Time : 42465.1 (sec)

#### **DFN 24 – Paleozoico – GNN - scan line 4/2014 (lunghezza 1-10 m; apertura media 1 mm)**

##### Session Summary

##### Fracture Modelling - Set 1

##### Input Parameters:

Input Grid: paleozoico

Intensity Value: 0.0293 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0065

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 13.9400

Orientation Param1: 79.70 deg

Orientation Param2: 13.08 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 545352

##### Fracture Modelling - Set 2

##### Input Parameters:

Input Grid: paleozoico

Intensity Value: 0.0080 m<sup>2</sup>/m<sup>3</sup>

P32: true

Length Definition is Power Law:

Length Param1: 1.0 m

Length Param2: 10.0 m

Length Param3: -0.0065

Orientation is Defined:

Distribution Is Fisher:

Fisher K Param: 6.0200

Orientation Param1: 36.08 deg

Orientation Param2: 104.09 deg

Aspect Ratio: 0.5

Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm

Number of Fractures: 148773

##### Fracture Modelling - Set 3

##### Input Parameters:

Input Grid: paleozoico  
 Intensity Value: 0.0133 m<sup>2</sup>/m<sup>3</sup>  
 P32: true  
 Length Definition is Power Law:  
 Length Param1: 1.0 m  
 Length Param2: 10.0 m  
 Length Param3: -0.0065  
 Orientation is Defined:  
 Distribution Is Fisher:  
 Fisher K Param: 54.1800  
 Orientation Param1: 83.65 deg  
 Orientation Param2: 195.86 deg  
 Aspect Ratio: 0.5  
 Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
 Number of Fractures: 247675  
 Fracture Modelling - Set 4  
 Input Parameters:  
 Input Grid: paleozoico  
 Intensity Value: 0.0213 m<sup>2</sup>/m<sup>3</sup>  
 P32: true  
 Length Definition is Power Law:  
 Length Param1: 1.0 m  
 Length Param2: 10.0 m  
 Length Param3: -0.0065  
 Orientation is Defined:  
 Distribution Is Fisher:  
 Fisher K Param: 13.9200  
 Orientation Param1: 40.44 deg  
 Orientation Param2: 278.78 deg  
 Aspect Ratio: 0.5  
 Aperture: (Proportional to Root Length) - Coefficient used = 0.44 mm  
 Number of Fractures: 396137  
 Output Grid: paleozoico  
 Generated Properties:

	Min Value	Max Value
Frac_Session1_Porosity	0	0.000584354
Frac_Session1_Permability	0	76.287
Frac_Session1_Perm_KXX	0	73.192
Frac_Session1_Perm_KYY	0	64.89
Frac_Session1_Perm_KZZ	0	54.7176
Frac_Session1_Perm_KXY	-17.7839	9.0098
Frac_Session1_Perm_KXZ	-11.8202	19.3722
Frac_Session1_Perm_KYZ	-13.5719	17.9911
Frac_Session1_Anisotropy	1.08583	100
Frac_Session1_Perm_KB_Max	5.45426e-06	60.3061
Frac_Session1_Perm_KB_Min	0	51.1569
Frac_Session1_2D_Anisotropy	1.00129	100
Frac_Session1_P32	0	0.458646

Total Fracture Area: 2.45495e+07 (metre-squared)

Total Fracture Volume: 29347.2 (metre-cubed)  
Total Model Volume: 3.43371e+08 (metre-cubed)  
Average Fracture Porosity: 8.5468e-05  
Average Aperture: 0.00119543 (metre)  
Average DFN P32: 0.0714956 (1/metre)  
Run Time : 9296.6 (sec)