

Supplementary Information

Table 1a - Random data sampling analysis on subset of 2023 PIF Area

% of events	Year	Azimuth (°)	Dip (°)	Nr. of selected events	% of selected events	Total events in PIF Area
100	2023	247		52.8	353	61
50	2023	246		52	176	60
40	2023	246.9		51.5	139	59
30	2023	257.8		56.5	104	66

Table 1b - Comparison of MCC results by shifting the lattice by a random value

year	id_cylinder	strike (°)	dip (°)	number of associated events	total number of events
2019	4.4	205.6		11	8
2019	5.3	310.6		61.7	8
2019	5.4	263.6		44.7	25
2019	6.3	287.1		40.1	6
2019	6.4	136.9		5.4	22
2019	7.3	313.9		61.8	15
2020	4.4	296.4		55.6	8
2020	5.4	289.3		35.8	33
2020	6.3	171.5		30.7	24
2020	6.4	238.2		27.7	24
2020	7.3	349.1		34.2	17
2021	4.3	276.7		52.1	7
2021	4.4	58.6		66.4	12
2021	5.3	7		34.2	5
2021	5.4	251.7		31.8	26
2021	6.1	316.7		44.9	19
2021	6.3	140.2		40	30
2021	6.4	131.9		56.8	27
2021	7.3	312.4		65.8	18
2022	4.2	189.8		57.2	11
2022	4.3	226.3		72.7	8
2022	4.4	208		60.9	10
2022	5.3	282.2		50.9	18
2022	5.4	221.4		44.7	36
2022	6.3	106.5		25.9	38
2022	6.4	243.5		52.6	51
2022	7.3	354.7		41.1	46
2022	7.4	339.4		63.3	20
2022	7.5	43.1		31.3	15
2023	1.4	80.4		46.5	8
2023	2.6	62.6		66.3	8
2023	3.2	186		39.4	10
2023	3.4	286.4		19.6	10
2023	3.6	52.4		59.7	11
2023	3.7	216.5		27.7	9
2023	4.2	268.8		23.7	27
2023	4.3	33.4		60.9	15
2023	4.4	186.3		54.1	26
2023	4.6	193.6		46.9	6
2023	4.7	280.2		40.1	12
2023	5.2	337.7		29	26
2023	5.3	278		52.6	50
2023	5.4	223.1		61.3	82
2023	5.5	226.2		69.4	11
2023	6.2	118.9		70.1	26
2023	6.3	246.4		43.8	118
2023	6.4	256.1		56.9	143
2023	6.5	150.1		55.4	12
2023	6.6	342.8		42.9	5
2023	7.3	15.5		37.5	63
2023	7.4	56.7		62.7	51
2023	7.5	44.4		69.5	22
2023	7.6	85.7		53	21
2023	8.3	290.7		71.1	9
2023	8.5	33.4		25.7	49
2024	1.3	181.6		23.8	15
2024	1.4	155.6		48.3	14
2024	2.3	234.5		45.9	10
2024	2.6	131.7		64.6	16
2024	3.2	280.1		28.9	9
2024	3.4	237.8		75.2	12
2024	3.6	80.3		17.6	18
2024	3.7	162.1		61.4	7
2024	4.1	215.3		57.7	9
2024	4.2	341		43.3	36
2024	4.3	124.5		15.6	11
2024	4.4	216.6		41.9	27
2024	4.6	56.6		55.9	9
2024	4.7	35.8		25.5	10
2024	5.2	57.8		42.3	62
2024	5.3	302.9		36.1	39
2024	5.4	230.1		56.6	91
2024	5.7	62.4		31.6	7
2024	6.1	267.6		74.1	9
2024	6.2	265		33.9	28
2024	6.3	214		45.1	105
2024	6.4	260.7		54.8	171
2024	6.5	163.5		72	32
2024	7.2	145.9		48.3	10
2024	7.3	302.8		44.6	85
2024	7.4	305.4		59	57
2024	7.5	46.6		69.6	48
2024	7.6	132		15.7	11
2024	8.3	204.9		35.5	8
2024	8.5	314.9		31.2	20

year	id_cylinder	strike (°)	dip (°)	number of associated events	total number of events
2019	3.3	328.5		55.8	14
2019	4.2	182.5		63.1	7
2019	4.3	135.9		30	25
2019	5.3	323.8		61.9	24
2020	3.2	58.7		35	11
2020	3.3	10.7		38.1	13
2020	3.4	133.9		43.2	7
2020	4.2	20.9		60.4	23
2020	4.3	180.7		42.8	47
2020	5.2	138.4		69.4	15
2020	5.3	282.7		72.6	34
2021	2.2	236		42	6
2021	2.3	27.1		78.9	9
2021	3.2	305.8		37.8	5
2021	3.3	170.8		13.1	10
2021	3.4	224.1		48	7
2021	4.1	306.4		50.8	14
2021	4.2	298.2		19.3	17
2021	4.3	284.9		15.8	37
2021	4.4	37.5		73.6	8
2021	5.3	16.9		56.6	15
2022	2.2	197.8		56	18
2022	2.3	61.6		54.5	7
2022	3.1	183.5		60.3	5
2022	3.2	121.7		57.2	17
2022	3.3	84.3		30.6	11
2022	3.4	56.8		53.2	12
2022	4.2	159.8		8.8	34
2022	4.3	224.5		45.6	67
2022	4.4	166.9		57.9	18
2022	5.2	27.2		13.5	17
2022	5.3	276.5		60.1	62
2022	5.4	12.9		75.1	10
2022	6.3	355.3		77.1	8
2023	1.2	294.7		59.5	13
2023	1.5	74.1		45.6	8
2023	1.6	313.2		42	17
2023	2.1	206.5		32.4	7
2023	2.2	329.3		36.3	28
2023	2.3	142.3		35.7	18
2023	2.4	44.2		75.1	9
2023	2.5	141.4		41.3	6
2023	2.6	117.8		55.8	8
2023	3.1	106.7		65.3	33
2023	3.2	269.3		36.3	64
2023	3.3	314.6		8.7	23
2023	3.4	272.5		45.5	22
2023	4.1	127.5		65.6	20
2023	4.2	244		47	94
2023	4.3	230.6		56.2	150
2023	4.4	246.7		52.5	48
2023	5.1	93.9		74.2	11
2023	5.2	149.4		23.3	26
2023	5.3	277.4		58.9	123
2023	5.4	25.4		70.3	35
2023	5.5	146.6		54.9	8
2023	6.3	75.8		71.3	21
2023	6.4	32.1		16.6	20
2023	6.5	278		15.1	32
2024	1.2	209.9		56.4	9
2024	1.5	54.2		24.2	14
2024	1.6	101.4		48.8	14
2024	2.1	170.8		43.6	18
2024	2.2	206.8		31.9	25
2024	2.3	162.1		17.3	22
2024	2.4	165.4		64.4	12
2024	2.5	96.8		33	17
2024	2.6	39.5		46.3	10
2024	2.7	328.9		35.5	7
2024	3.1	128.4		42.5	35
2024	3.2	300.5		41	75
2024	3.3	173.3		2	35
2024	3.4	259.5		68.4	17
2024	4.1	92.8		53.1	33
2024	4.2	226		33.8	91
2024	4.3	231		61.4	160
2024	4.4	227.5		34.6	75
2024	5.1	84.2		51.3	9
2024	5.2	3.6		36.6	29
2024	5.3	270.7		64	160
2024	5.4	27.6		72.9	29
2024	5.5	80.8		64.5	7
2024	6.3	16.5		65.6	31
2024	6.4	195		51.7	9
2024	6.5	17.9		53.8	16

Table 2a - MCC inversion analysis within the 6_3, 6_4, 5_4 and 7_3 merged cylinders (PIF volume)

year	strike (°)	dip (°)	number of associated events	total number of events
2019	261	38	50	78
2020	312	26	67	138
2021	82	18	59	125
2022	245	53	138	224
2023	247	53	353	576
2024	244	53	401	670

Table 2b - MCC inversion analysis within a 3km x 2 km large cylindrical volume centered around the PIF merged cylinders

year	strike (°)	dip (°)	number of associated events	total number of events
2019	318	17	53	101

2020	321	25	71	153
2021	74	2	59	149
2022	250	37	149	294
2023	252	46	433	763
2024	254	49	544	943

Table 2c1 - MCC inversion by adding a random error to event locations within the declared measure error for each event location

year	strike (°)	dip (°)	number of associated events	total number of events	average strike (°)	average dip (°)	error strike (°)	error dip (°)
2019	232	14	49	78	252	23	14.6	7.8
2019	255	29	46	78				
2019	261	9	39	78				
2019	251	32	48	78				
2019	241	27	47	78				
2019	250	26	49	78				
2019	229	15	49	78				
2019	277	30	45	78				
2019	259	22	44	78				
2019	262	27	47	78				
2020	318	18	60	138	294	26	32.9	6.0
2020	256	34	74	138				
2020	305	28	69	138				
2020	301	38	78	138				
2020	323	22	62	138				
2020	323	22	63	138				
2020	307	26	63	138				
2020	236	23	71	138				
2020	324	23	67	138				
2020	244	31	77	138				
2021	105	2	52	125	213	12	86.0	7.2
2021	101	19	61	125				
2021	250	6	52	125				
2021	307	13	54	125				
2021	335	1	53	125				
2021	93	24	59	125				
2021	241	9	54	125				
2021	163	17	56	125				
2021	289	17	48	125				
2021	249	10	51	125				
2022	253	40	111	224	254	40	5.5	6.3
2022	248	49	144	224				
2022	250	40	107	224				
2022	251	49	133	224				
2022	247	35	107	224				
2022	254	33	106	224				
2022	263	32	102	224				
2022	261	37	106	224				
2022	249	50	129	224				
2022	261	38	114	224				
2023	252	52	337	576	247	49	2.7	1.5
2023	249	47	335	576				
2023	245	49	338	576				
2023	246	49	332	576				
2023	244	48	332	576				
2023	247	51	346	576				
2023	246	49	328	576				
2023	245	48	317	576				
2023	251	47	315	576				
2023	246	48	326	576				
2024	247	53	407	670	249	53	4.0	1.1
2024	253	54	403	670				
2024	254	54	398	670				
2024	255	50	372	670				
2024	246	53	400	670				
2024	249	53	404	670				
2024	242	53	397	670				
2024	246	53	388	670				
2024	250	54	409	670				
2024	245	54	398	670				

Table 2c2 - MCC inversion by adding a random error to event locations within the declared measure error for each event location within the 3 km diameter cylinder centered on the merged volume

year	strike (°)	dip (°)	number of associated events	total number of events	average strike (°)	average dip (°)	error strike (σ)	error dip (σ)
2019	314	9	53	101	262	18	112.4	6.0
2019	328	25	53	101				
2019	309	22	51	101				
2019	307	27	62	101				
2019	24	21	52	101				
2019	309	20	60	101				
2019	335	22	58	101				
2019	319	13	47	101				
2019	53	11	44	101				
2019	322	13	50	101				
2020	303	19	71	153	304	22	14.2	7.0
2020	286	28	74	153				
2020	321	19	68	153				
2020	289	39	85	153				
2020	324	20	67	153				
2020	303	22	69	153				
2020	306	20	68	153				
2020	321	12	69	153				
2020	282	14	73	153				
2020	308	23	73	153				
2021	334	4	56	149	166	5	117.0	2.2
2021	352	3	59	149				
2021	50	6	62	149				
2021	12	10	65	149				
2021	201	3	63	149				
2021	192	3	60	149				
2021	95	6	61	149				
2021	241	2	61	149				
2021	178	6	58	149				
2021	11	4	62	149				
2022	244	43	160	294	248	38	3.6	3.7
2022	244	37	154	294				
2022	255	36	144	294				
2022	251	40	157	294				
2022	247	35	143	294				
2022	250	38	144	294				
2022	245	37	151	294				
2022	249	32	130	294				
2022	247	41	158	294				
2022	252	44	160	294				
2023	252	44	407	763				
2023	255	44	421	763				

2023	255	45	428	763	254	45	2.2	0.9
2023	257	46	444	763				
2023	251	45	440	763				
2023	252	45	415	763				
2023	257	46	424	763				
2023	254	46	431	763				
2023	252	45	408	763				
2023	254	43	422	763				
2024	254	48	527	943	255	47	2.9	1.4
2024	255	47	515	943				
2024	253	48	524	943				
2024	253	45	485	943				
2024	253	46	502	943				
2024	263	50	547	943				
2024	255	45	499	943				
2024	252	46	507	943				
2024	254	47	517	943				
2024	256	47	517	943				

Table 3 - Angular distance among adjacent best-fit planes. The figure shows the planar view of cylinder locations and the best-fit planes attributes

