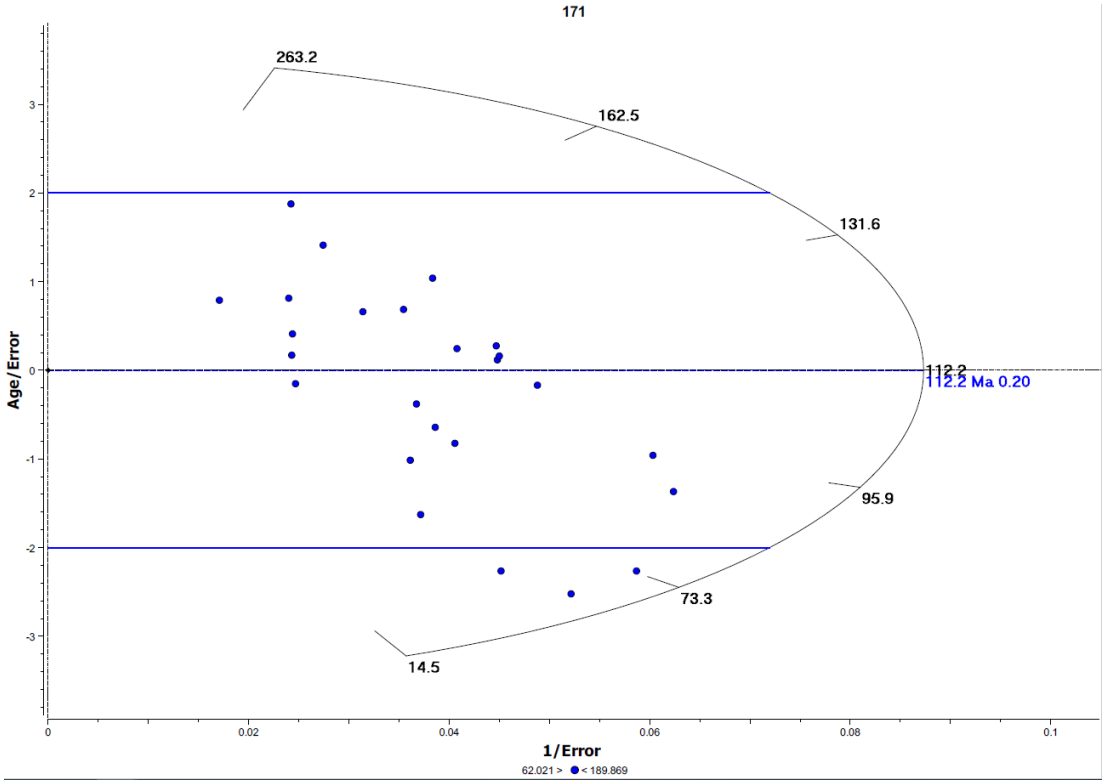
S1: Radial plot and Age vs. Age plot

Figure S1. Radial plot and Age vs. Age plot of AFT single grain ages for sample 171, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



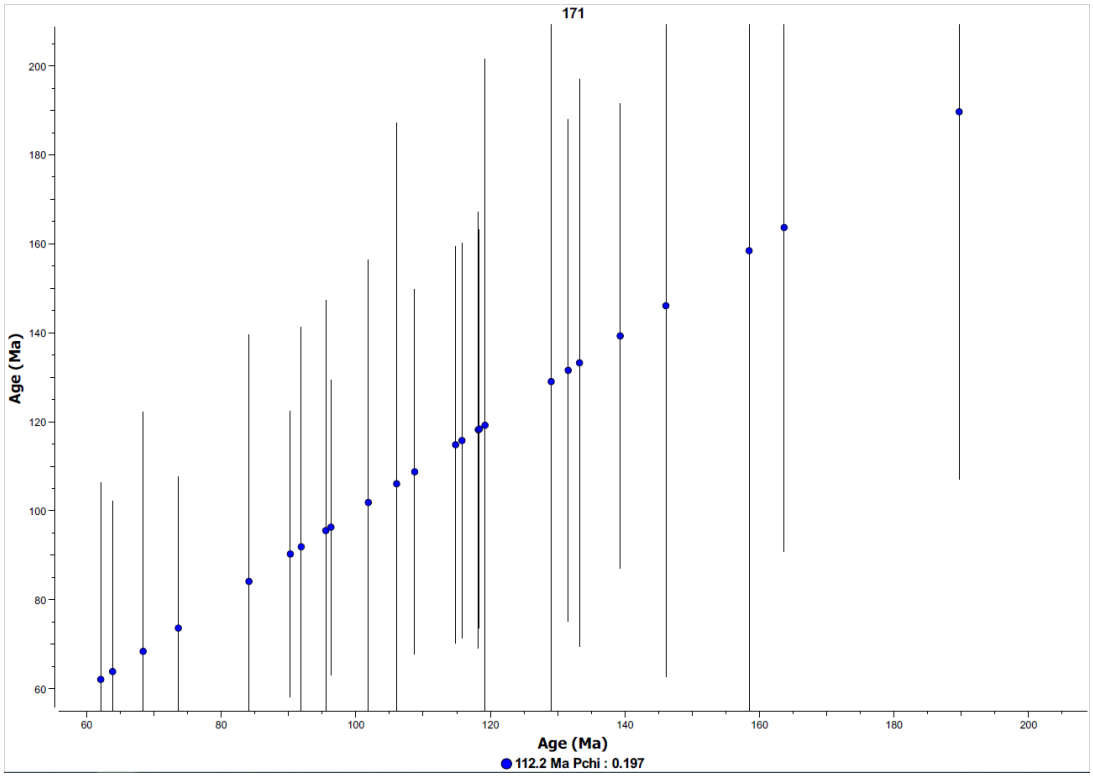
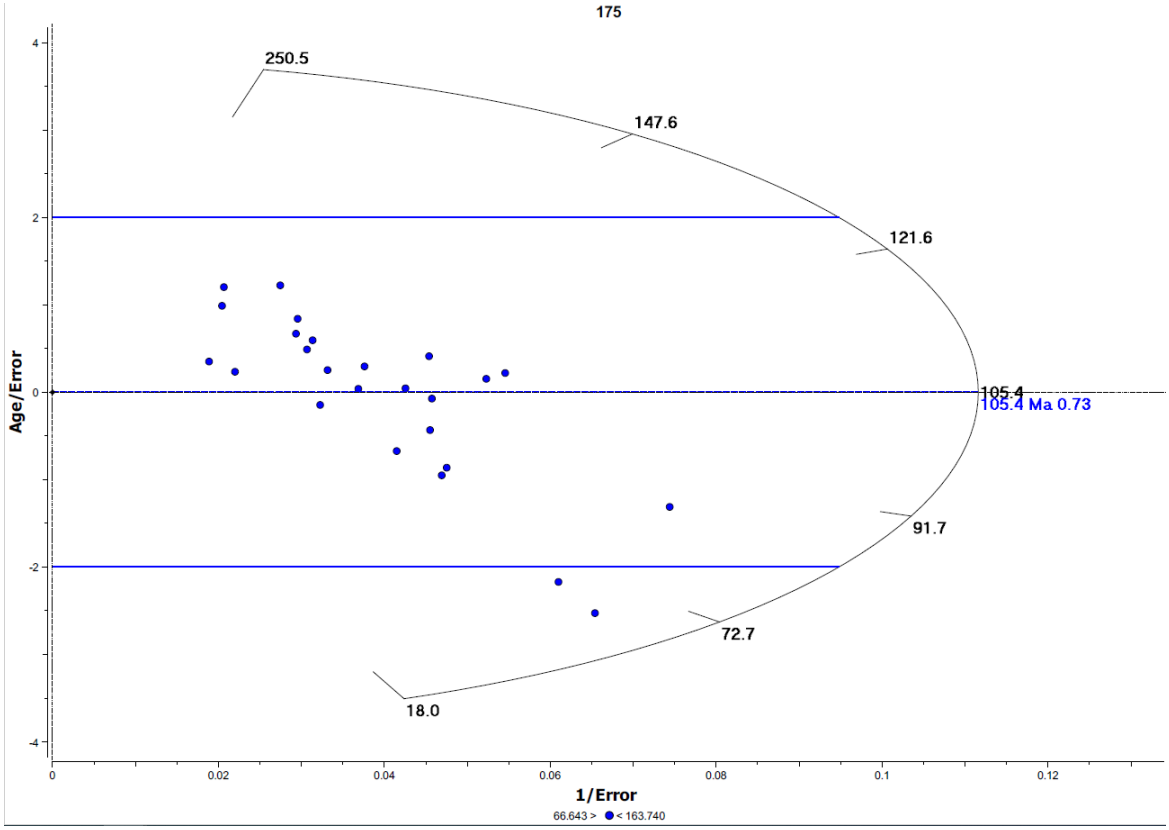


Figure S2. Radial plot and Age vs. Age plot of AFT single grain ages for sample 175, constructed using QTQt (Gallagher, 2012). The "y" axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the "y" axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a "standardised estimate".



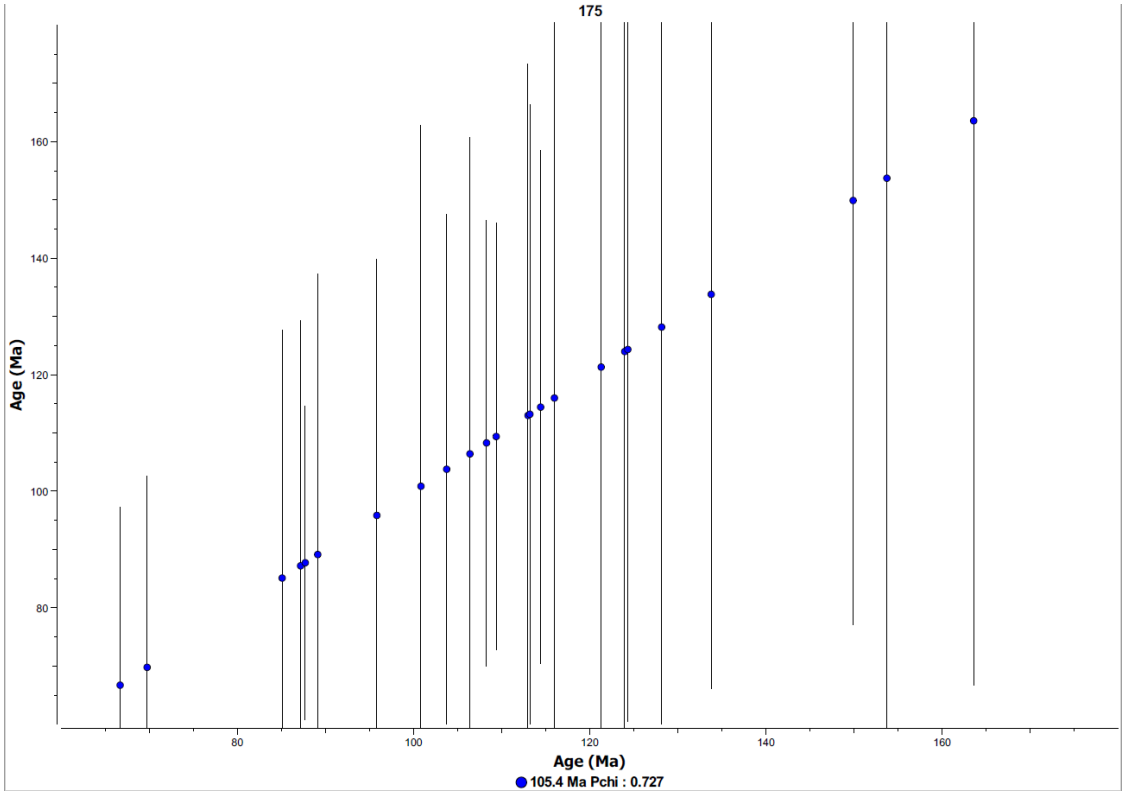
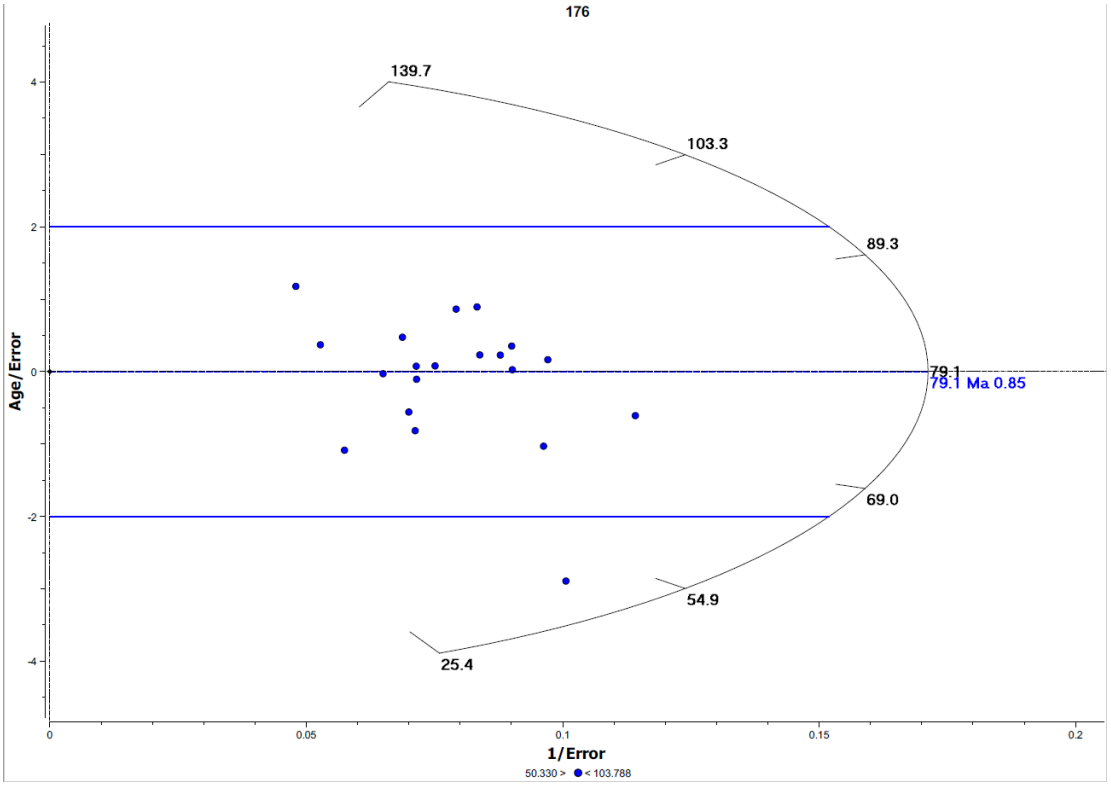


Figure S3. Radial plot and Age vs. Age plot of AFT single grain ages for sample 176, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



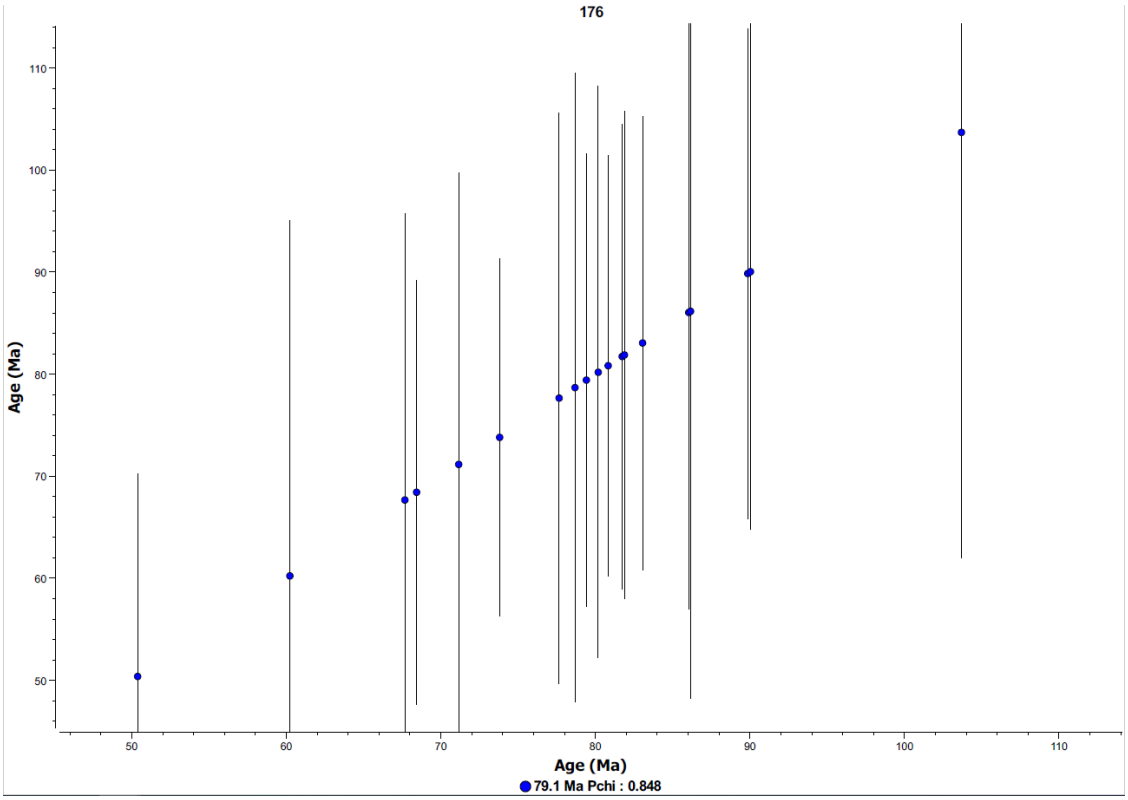


Figure S4. Radial plot and Age vs. Age plot of AFT single grain ages for sample 180, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.

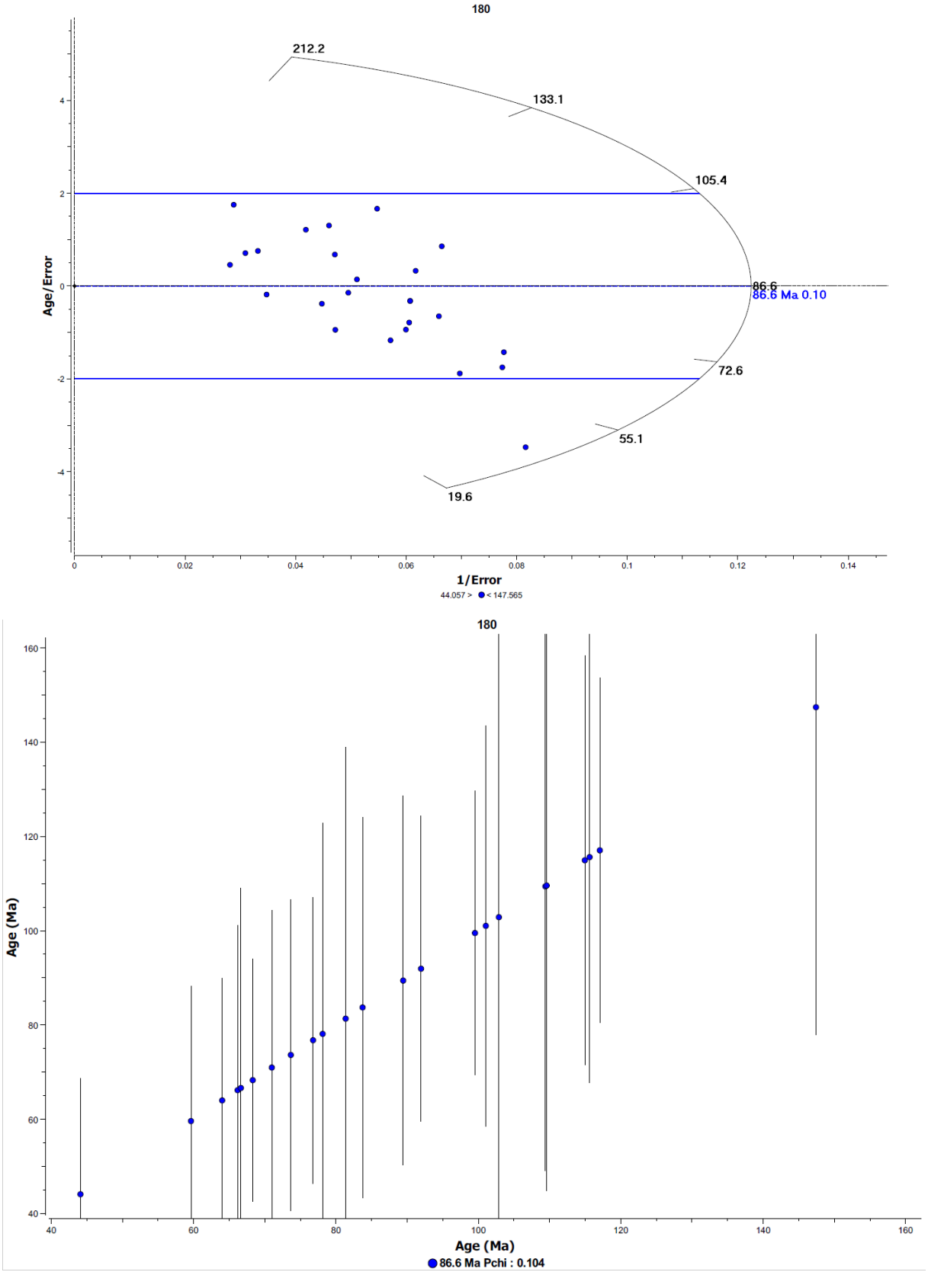
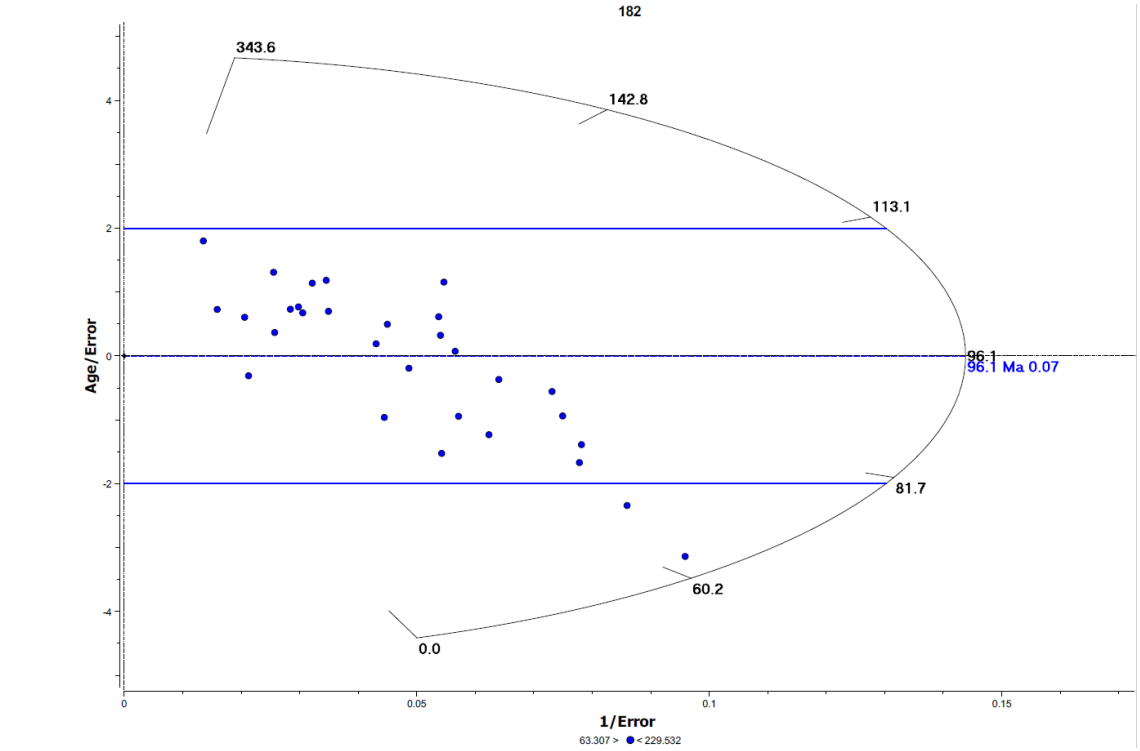


Figure S1. Radial plot and Age vs. Age plot of AFT single grain ages for sample 182, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



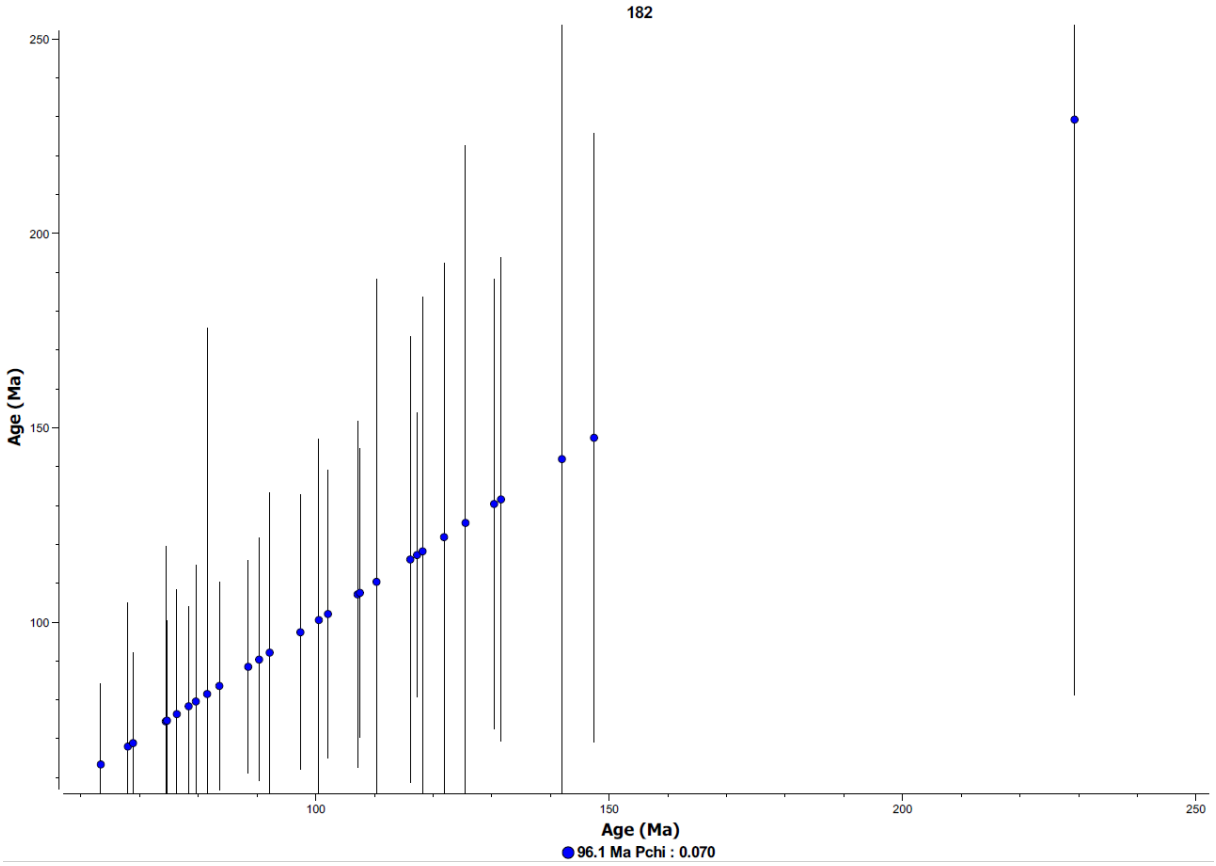
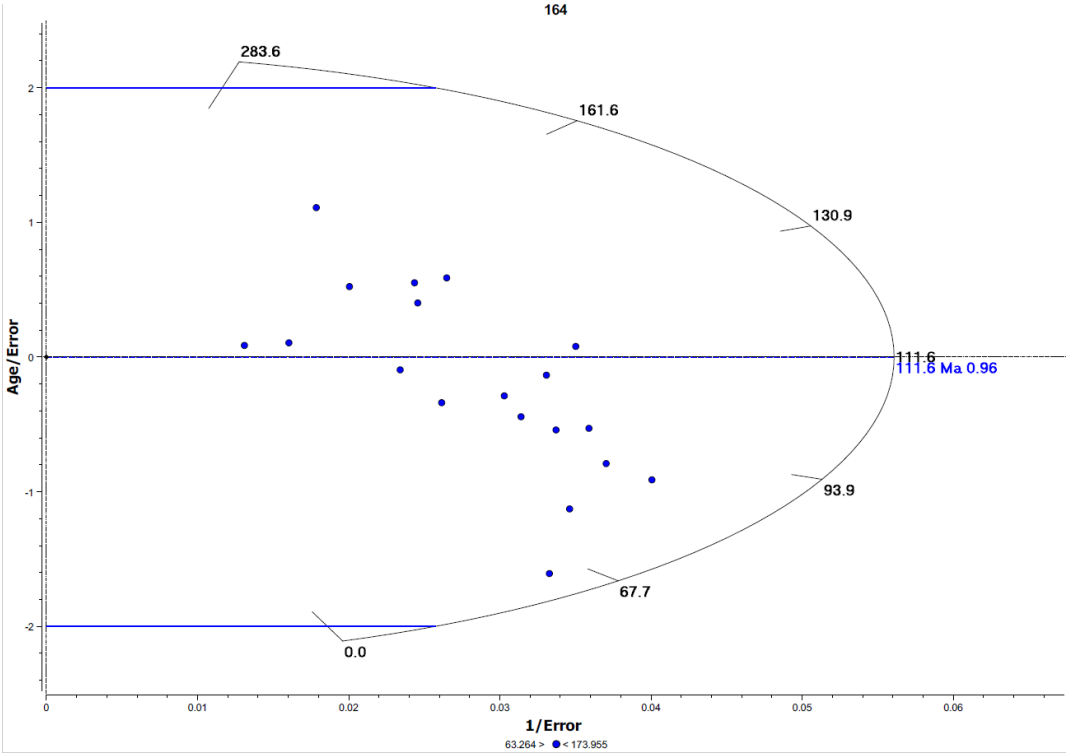


Figure S.6. Radial plot and Age vs. Age plot of AFT single grain ages for sample 164, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



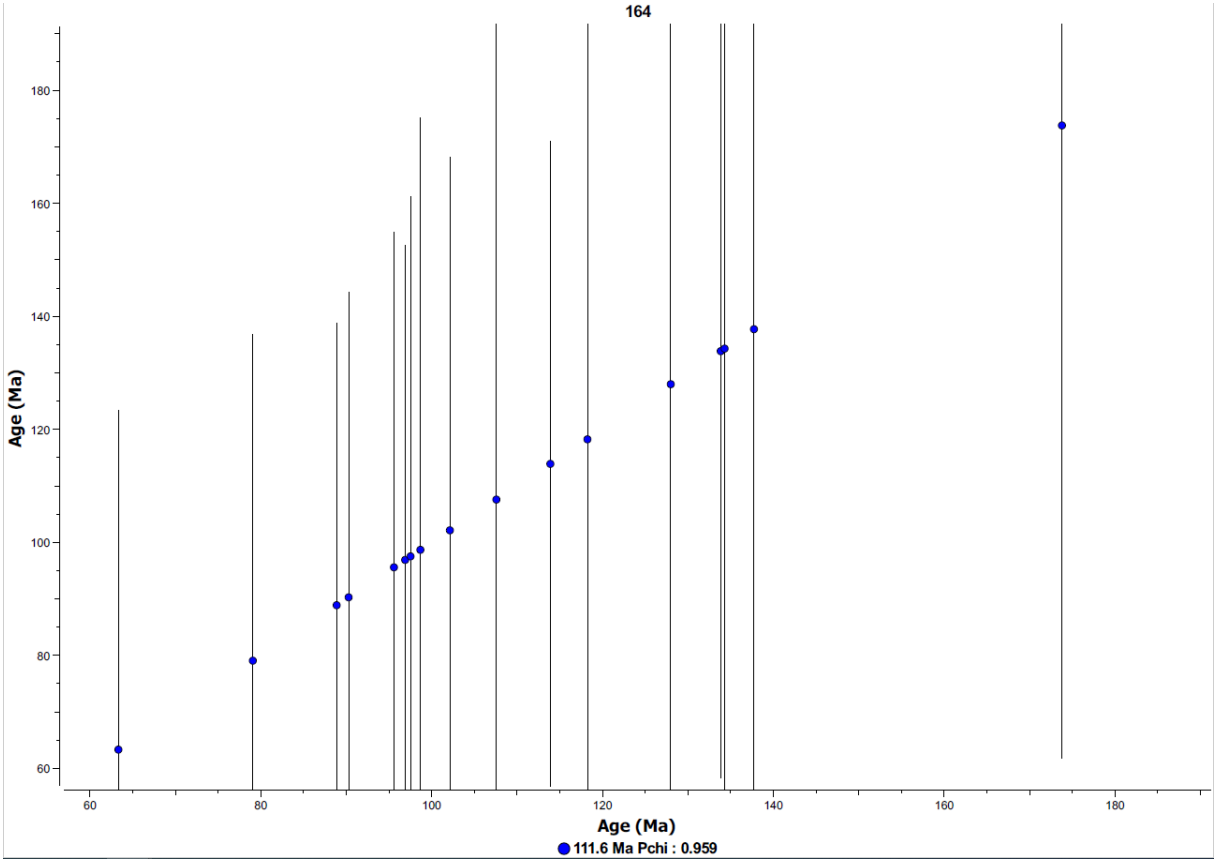
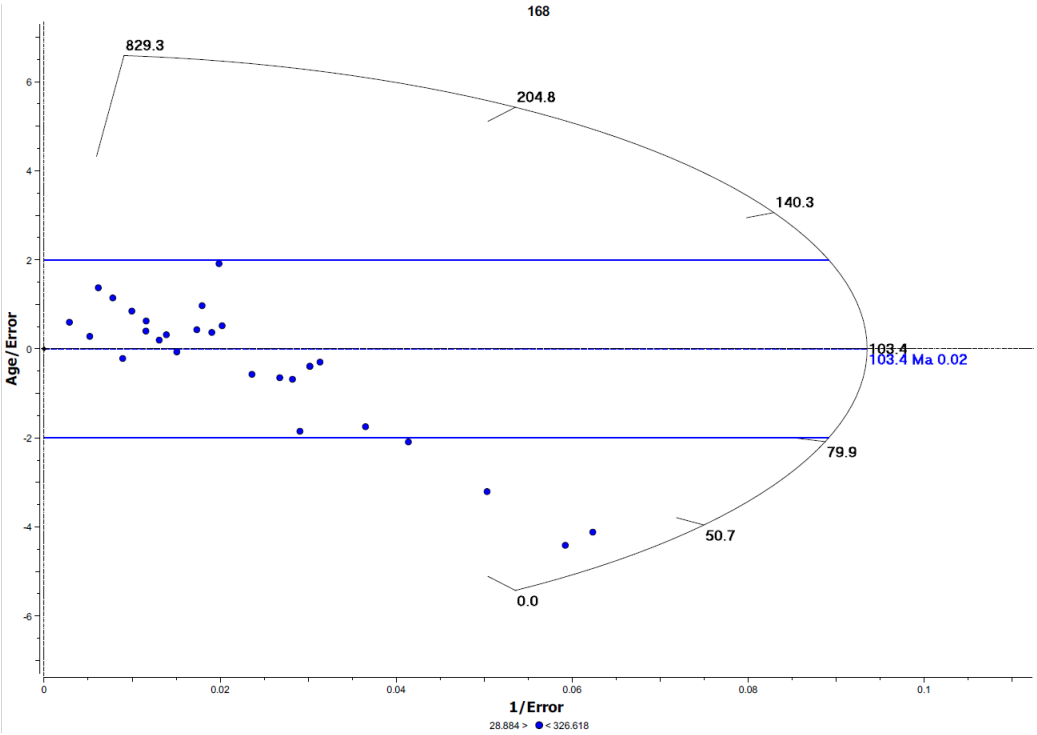


Figure S.7. Radial plot and Age vs. Age plot of AFT single grain ages for sample 168, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



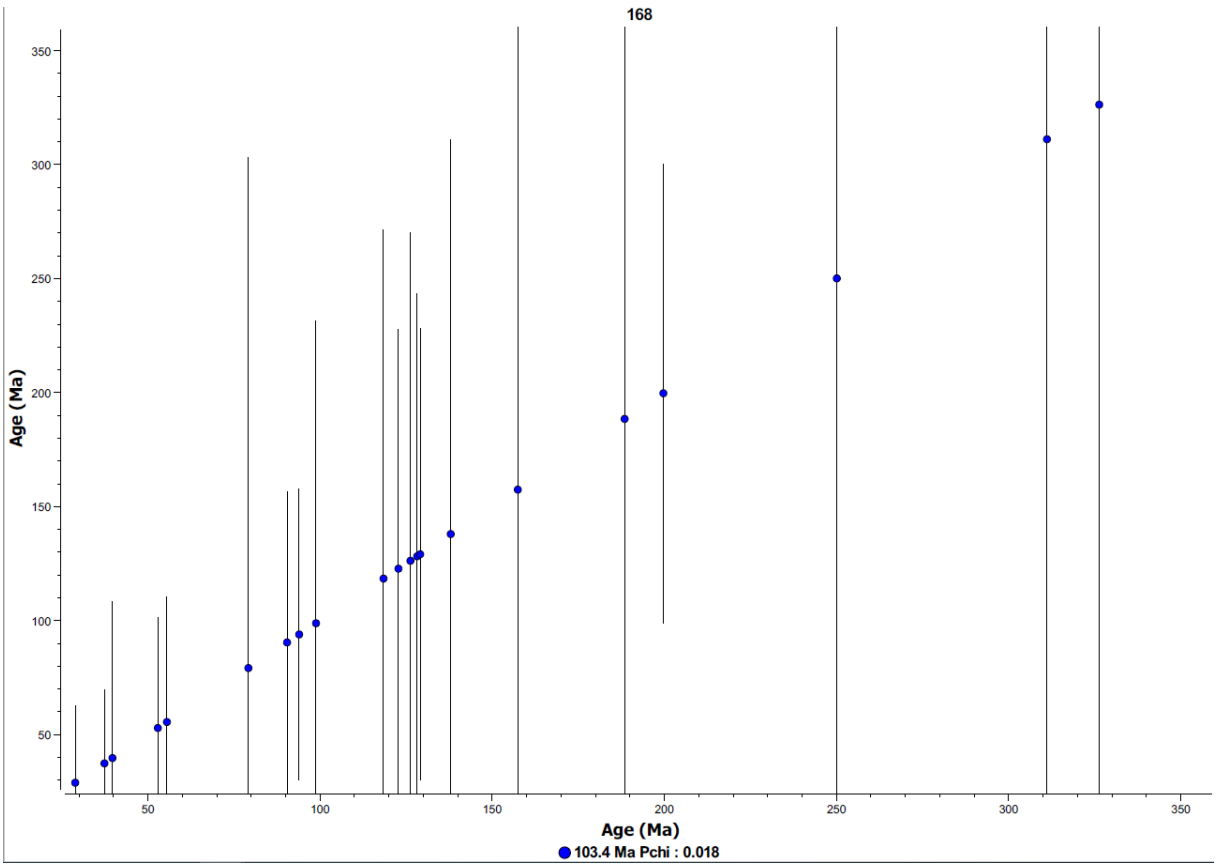
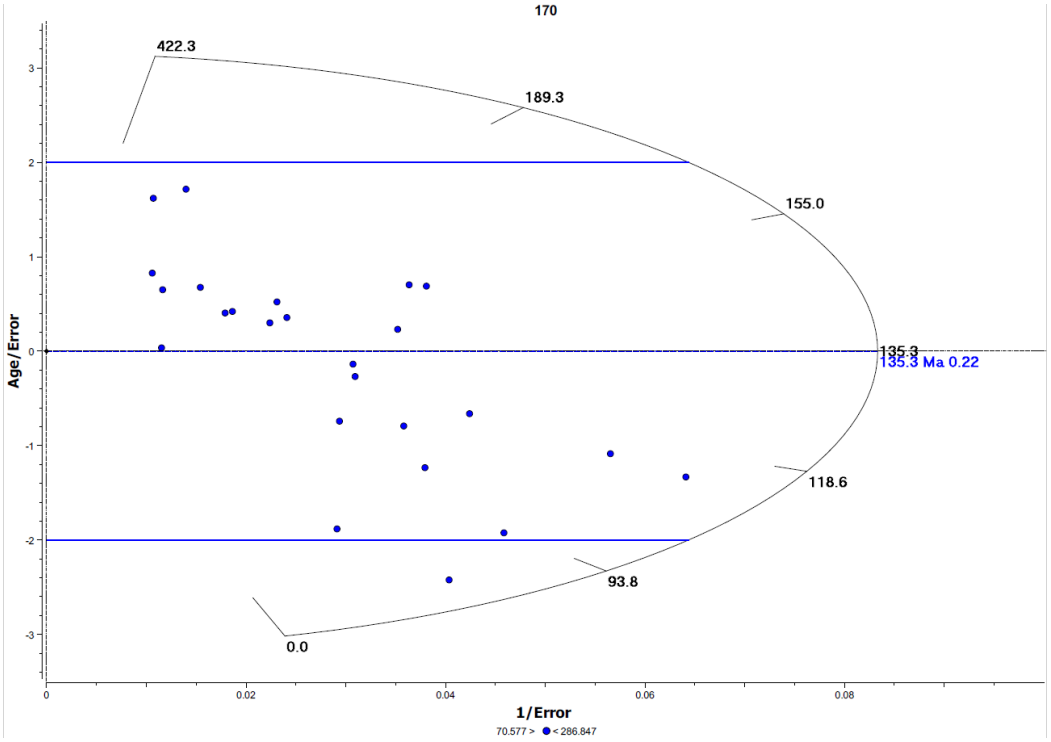


Figure S.8. Radial plot and Age vs. Age plot of AFT single grain ages for sample 170, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



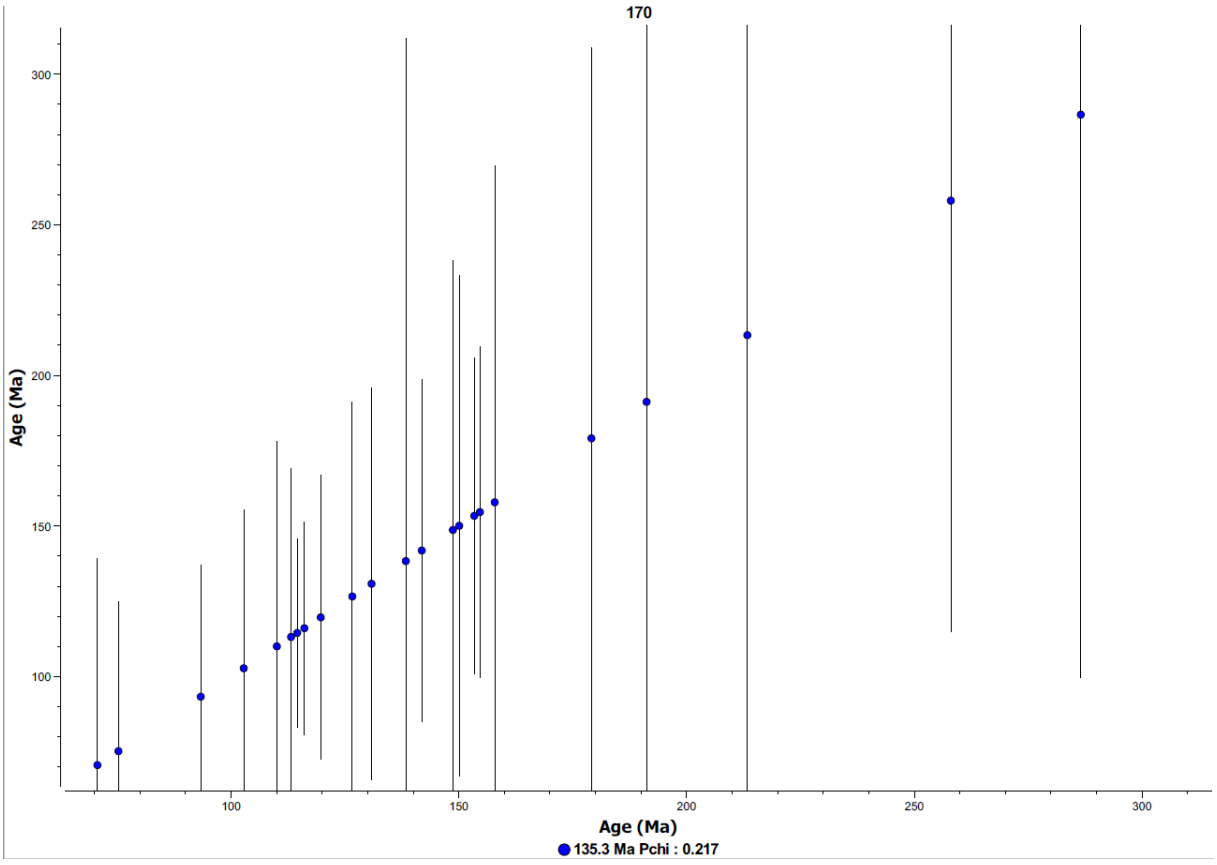


Figure S.9. Radial plot and Age vs. Age plot of AFT single grain ages for sample 501, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.

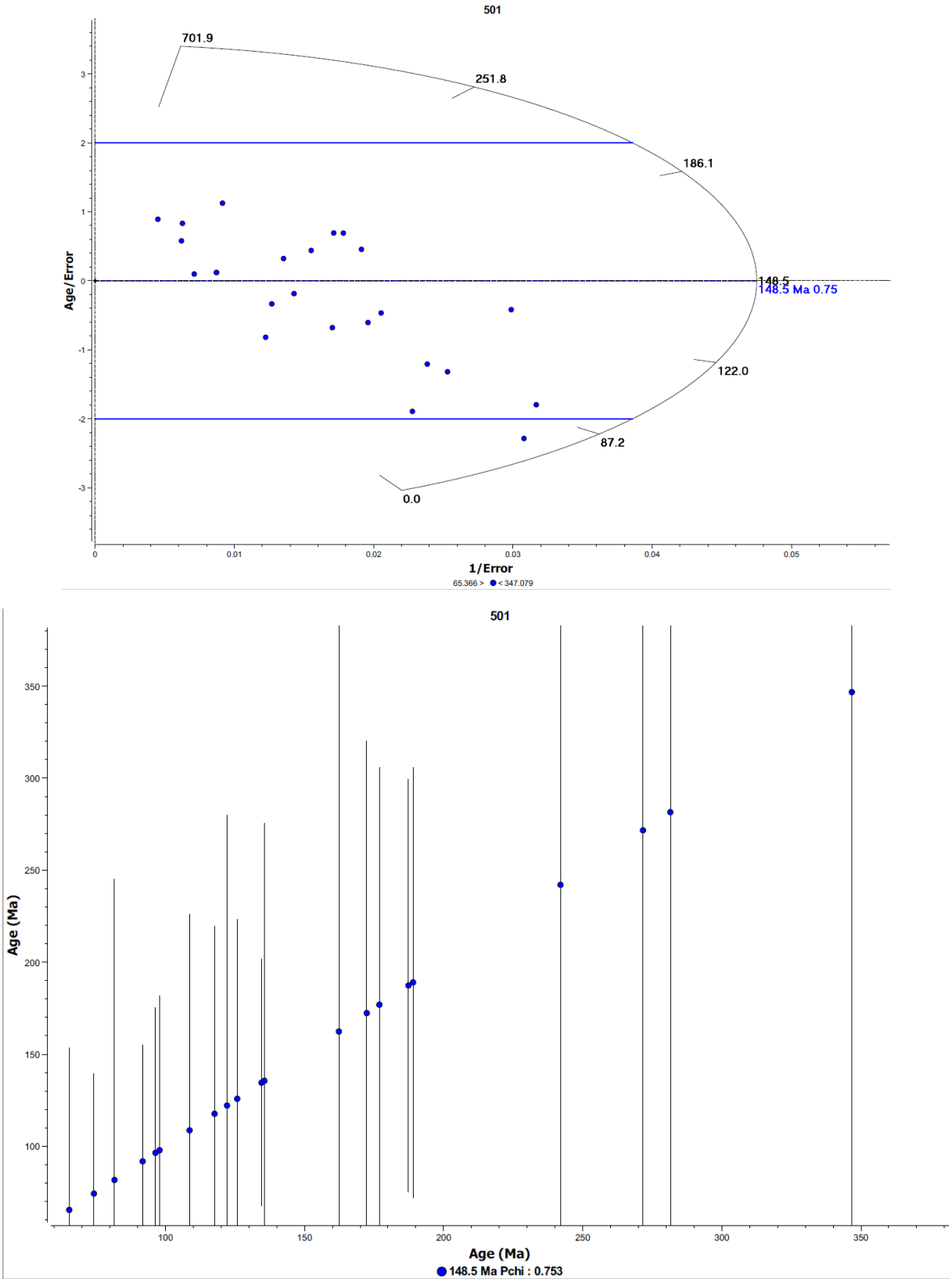
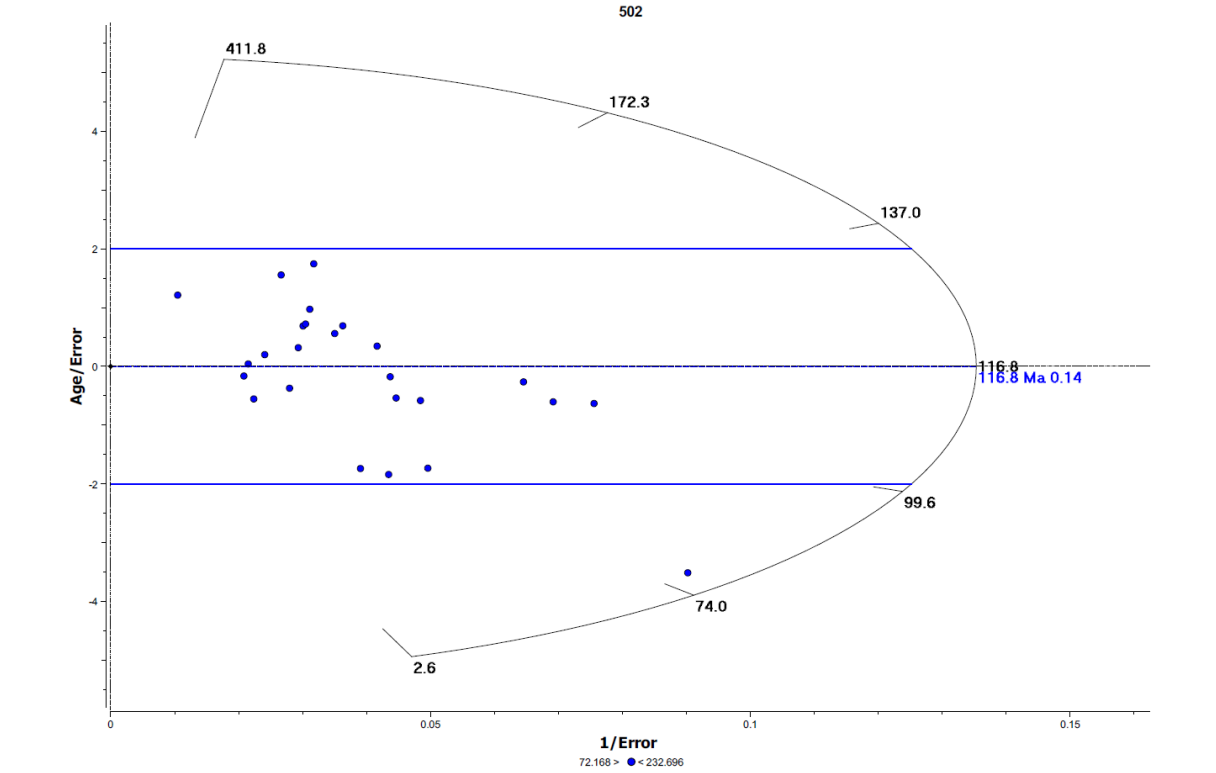


Figure S.10. Radial plot and Age vs. Age plot of AFT single grain ages for sample 502, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



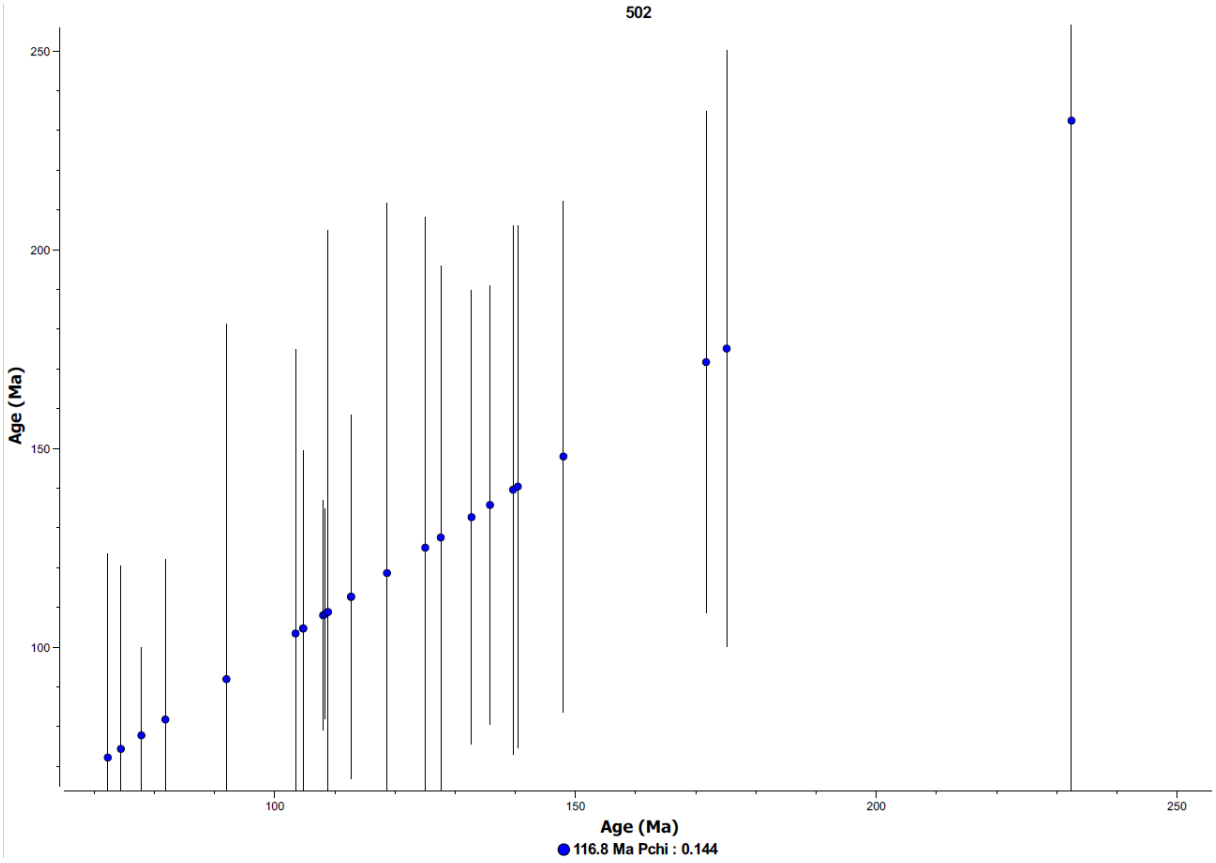
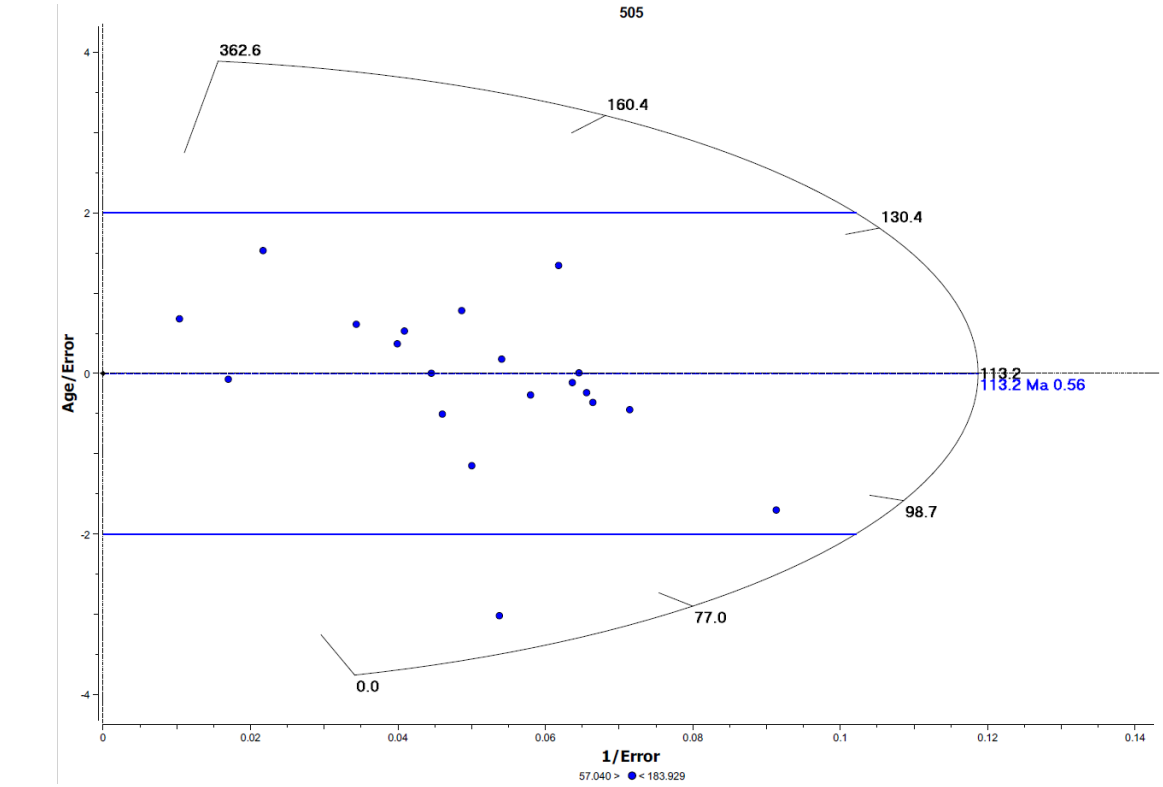


Figure S.11. Radial plot and Age vs. Age plot of AFT single grain ages for sample 505, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



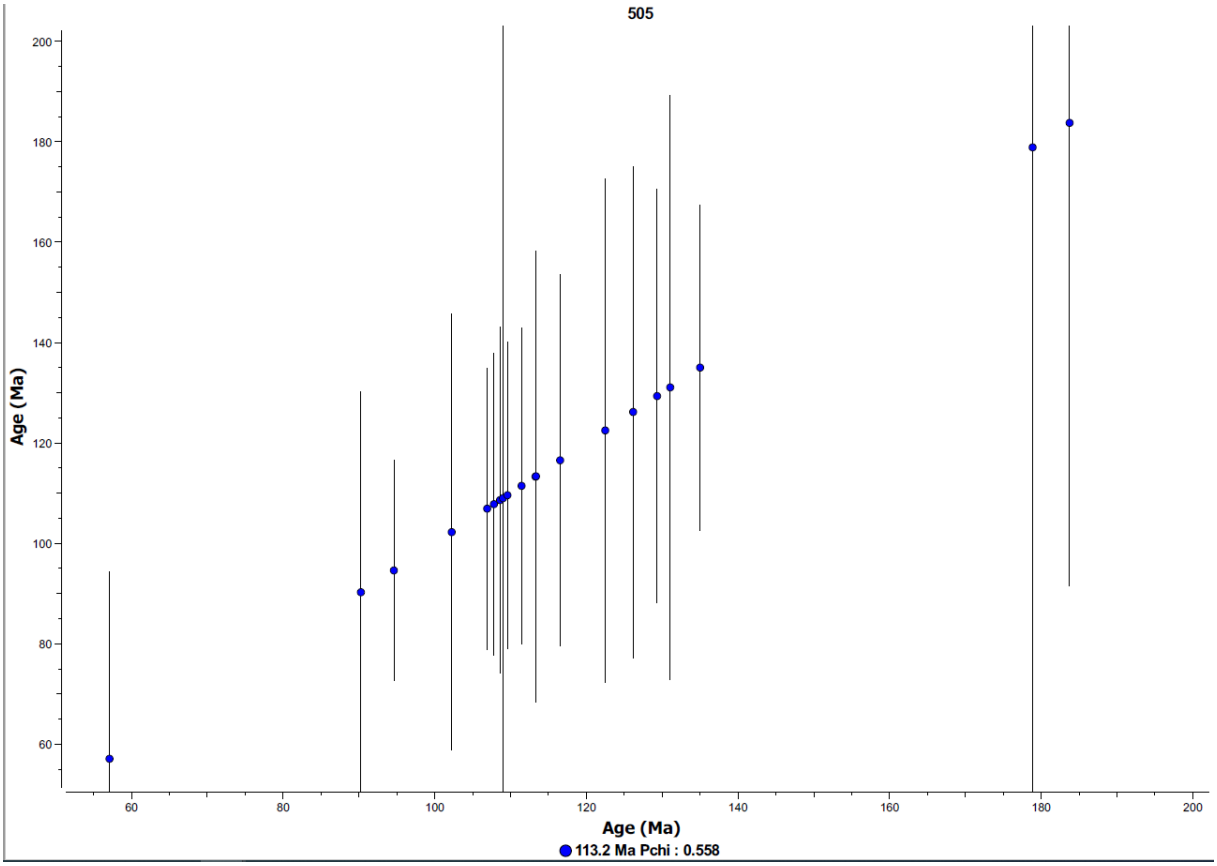
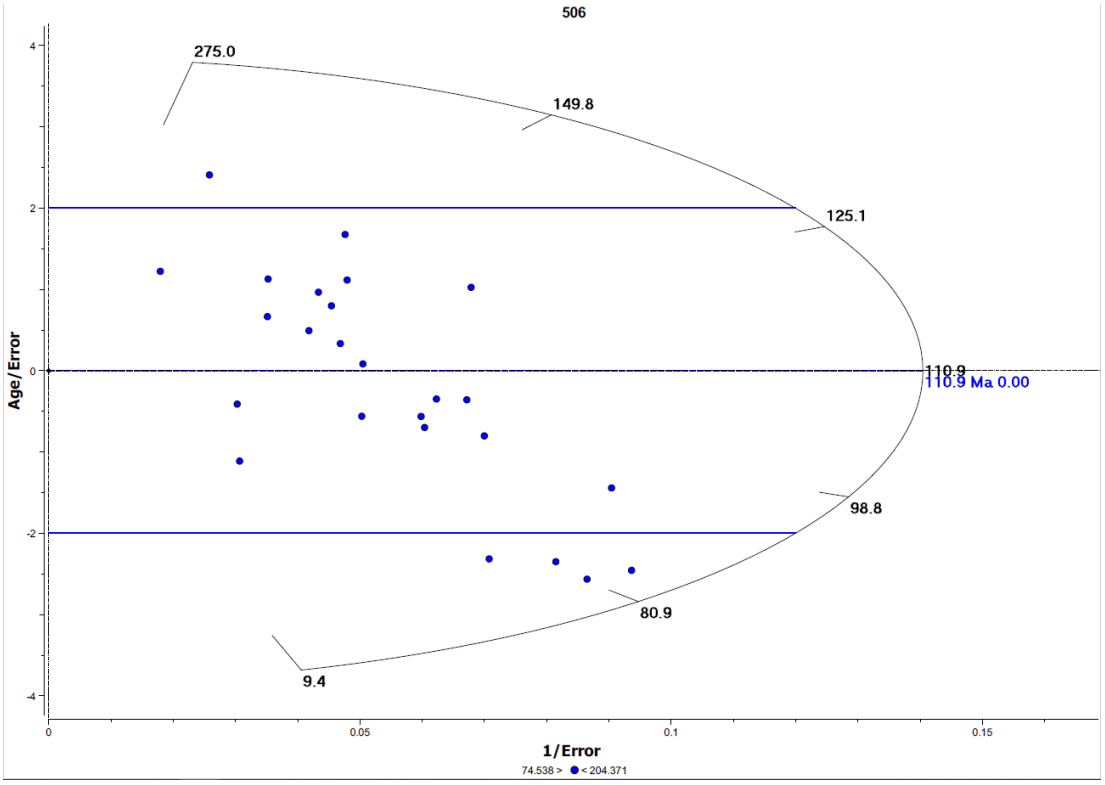


Figure S.12. Radial plot and Age vs. Age plot of AFT single grain ages for sample 506, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



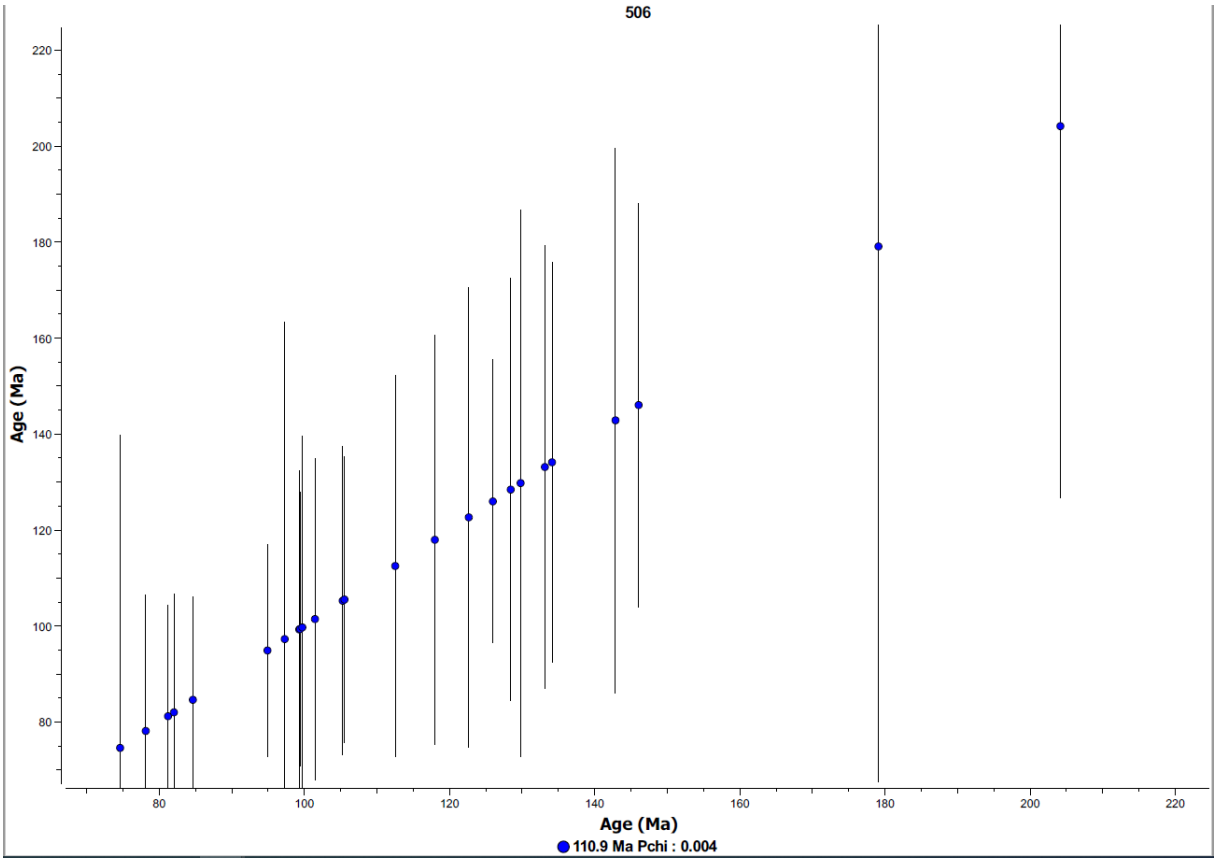
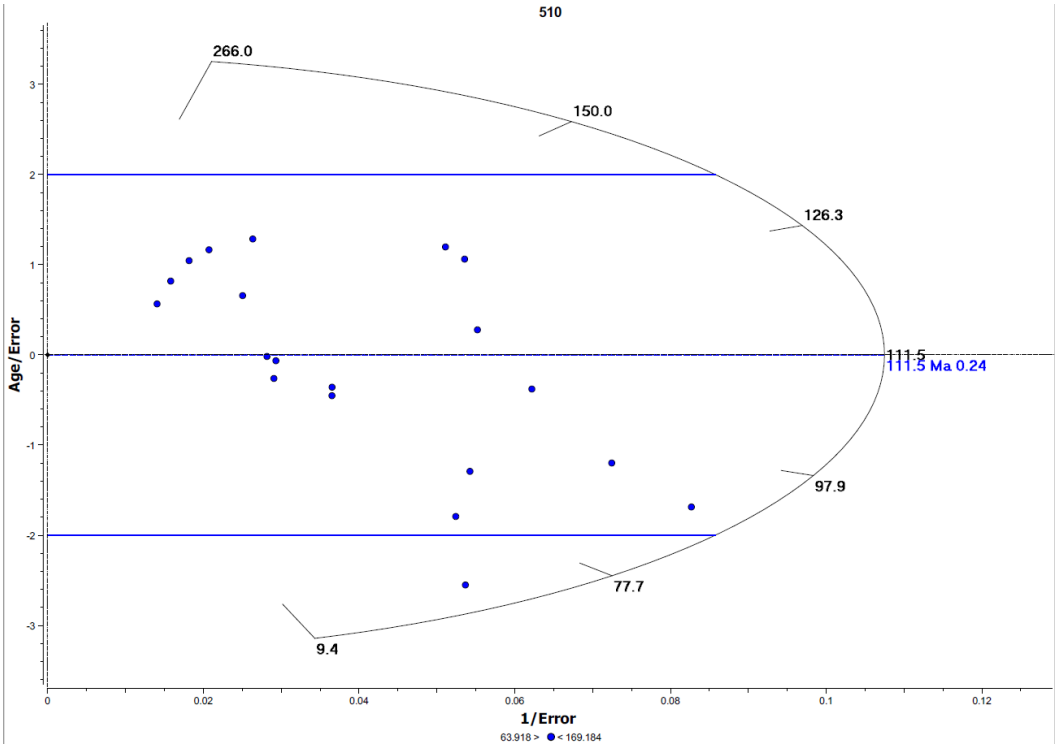


Figure S.13. Radial plot and Age vs. Age plot of AFT single grain ages for sample 510, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



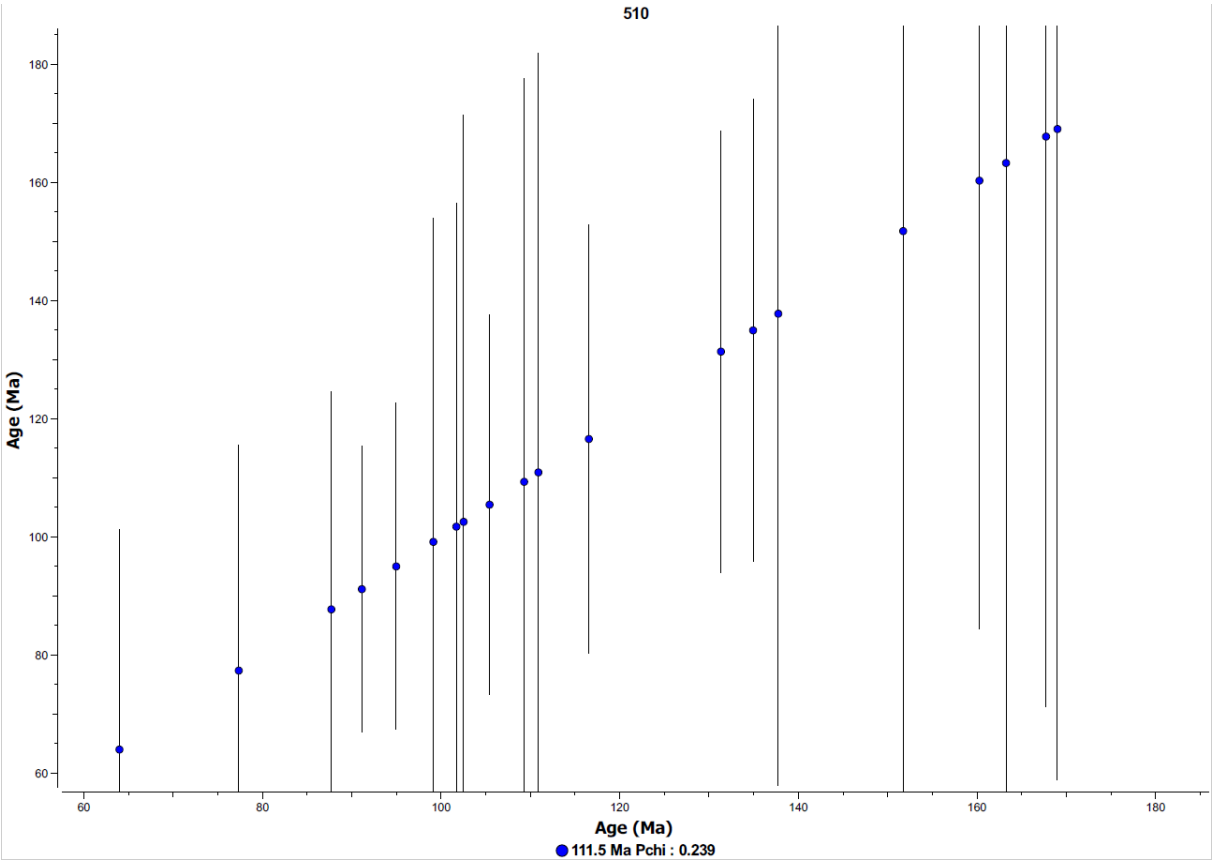
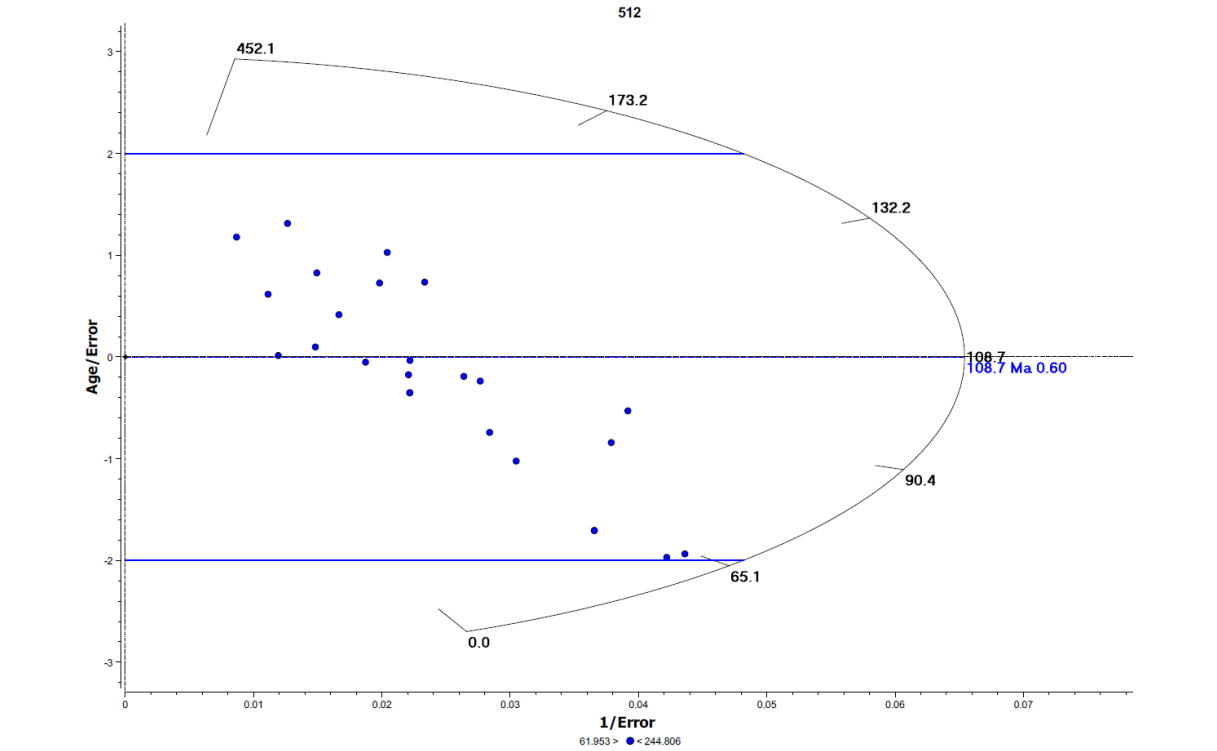


Figure S.14. Radial plot and Age vs. Age plot of AFT single grain ages for sample 512, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



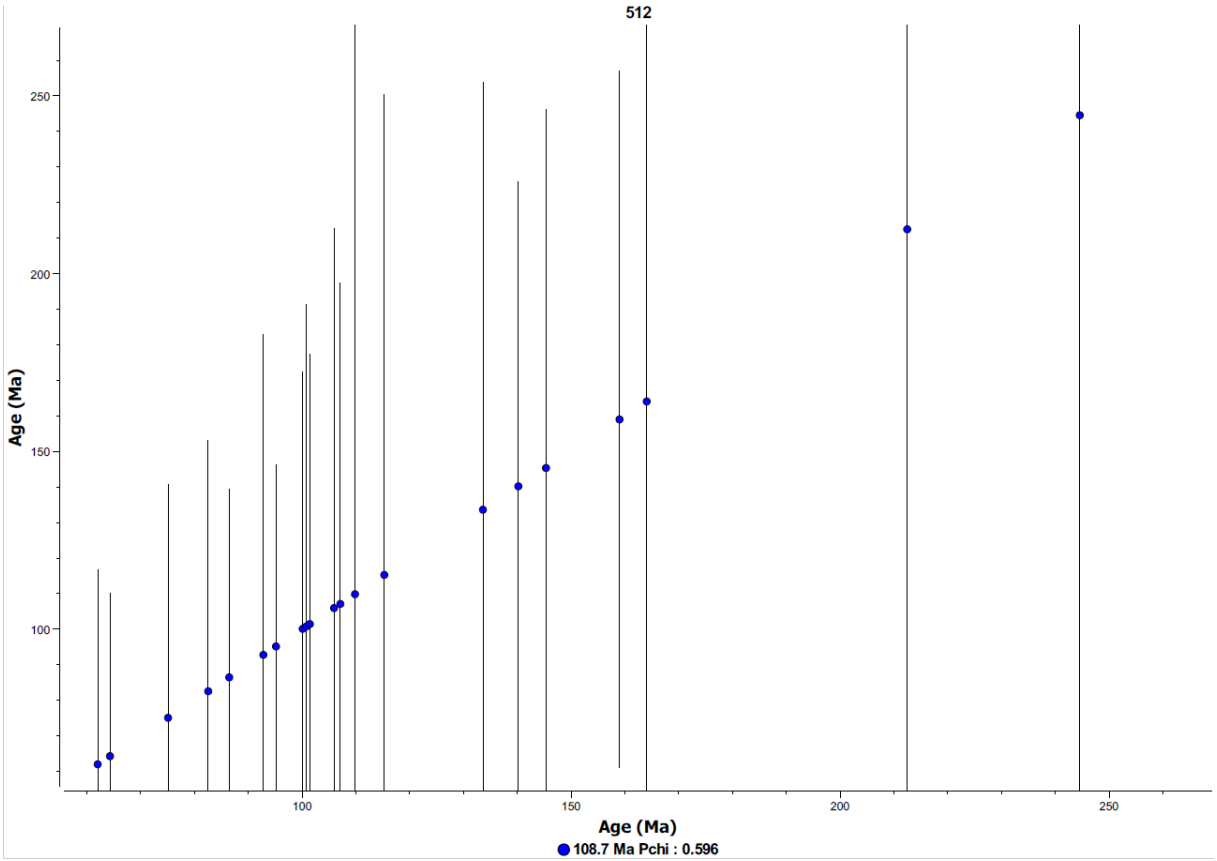
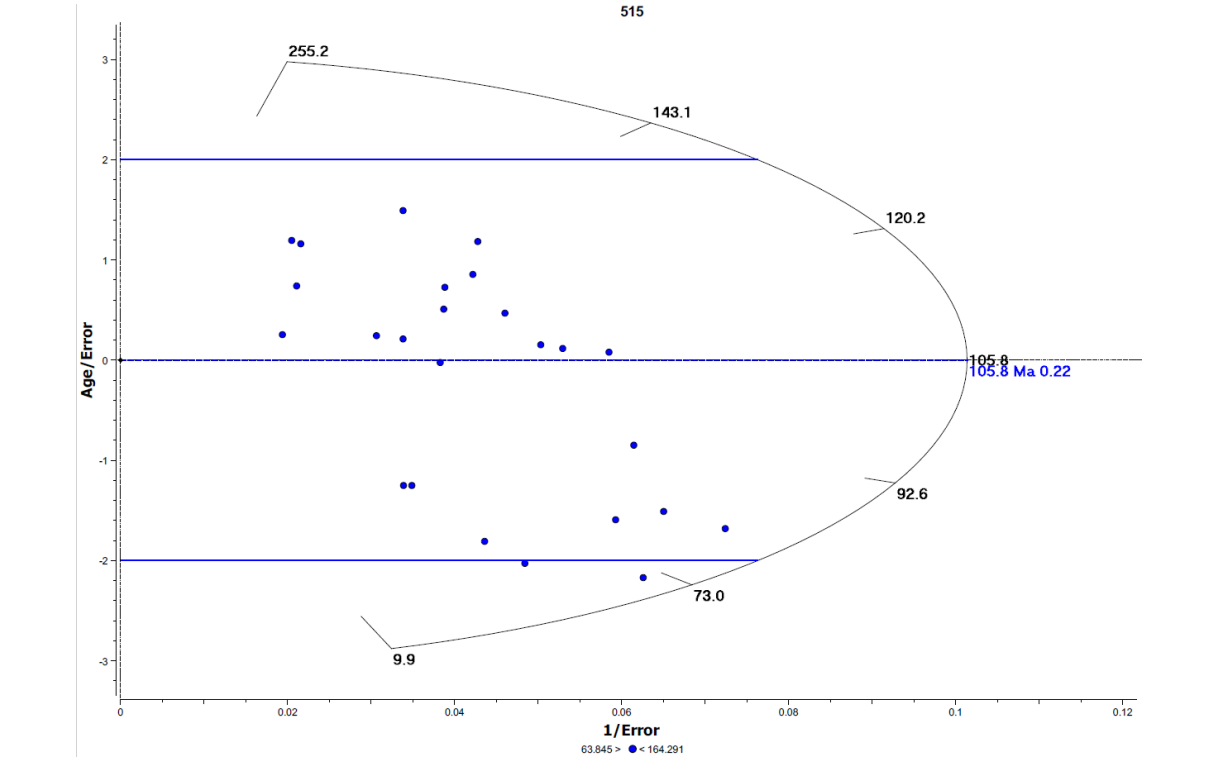


Figure S.15. Radial plot and Age vs. Age plot of AFT single grain ages for sample 515, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



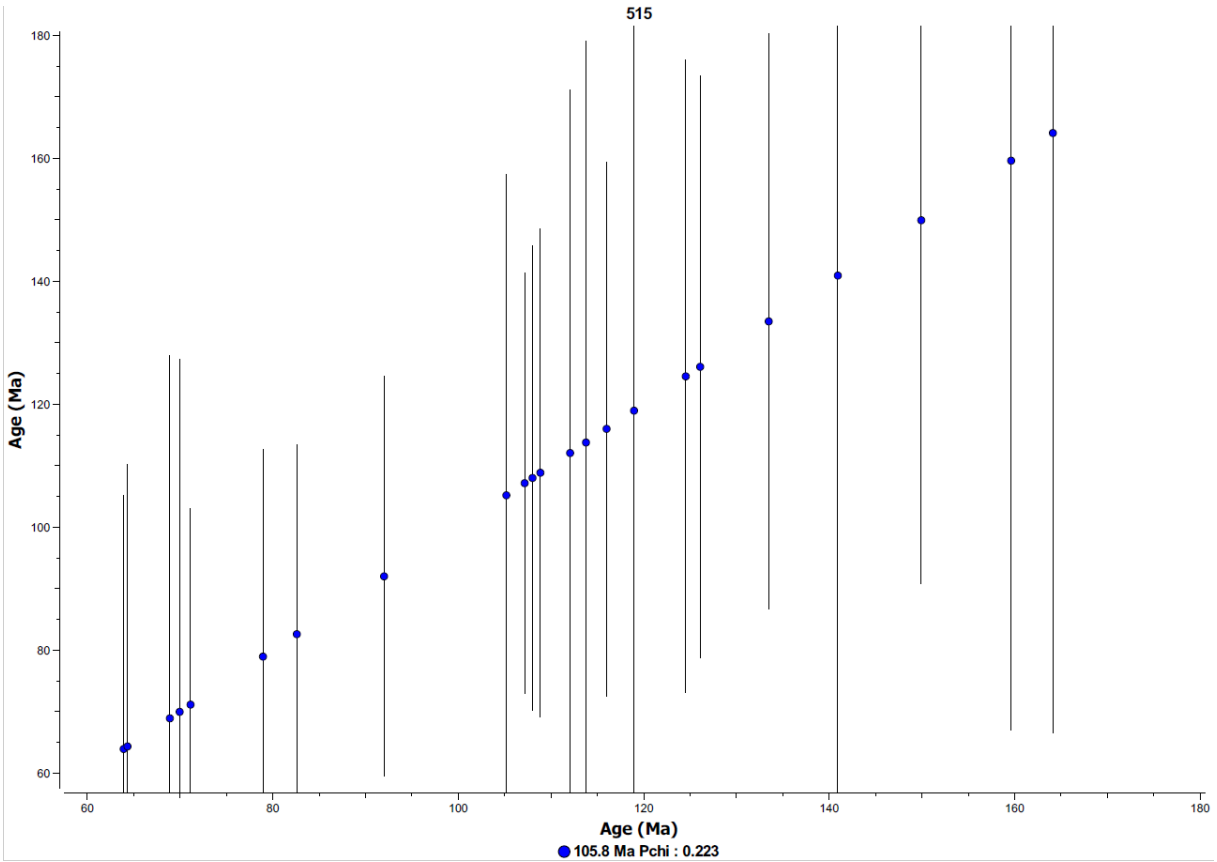


Figure S.16. Radial plot and Age vs. Age plot of AFT single grain ages for sample 516, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.

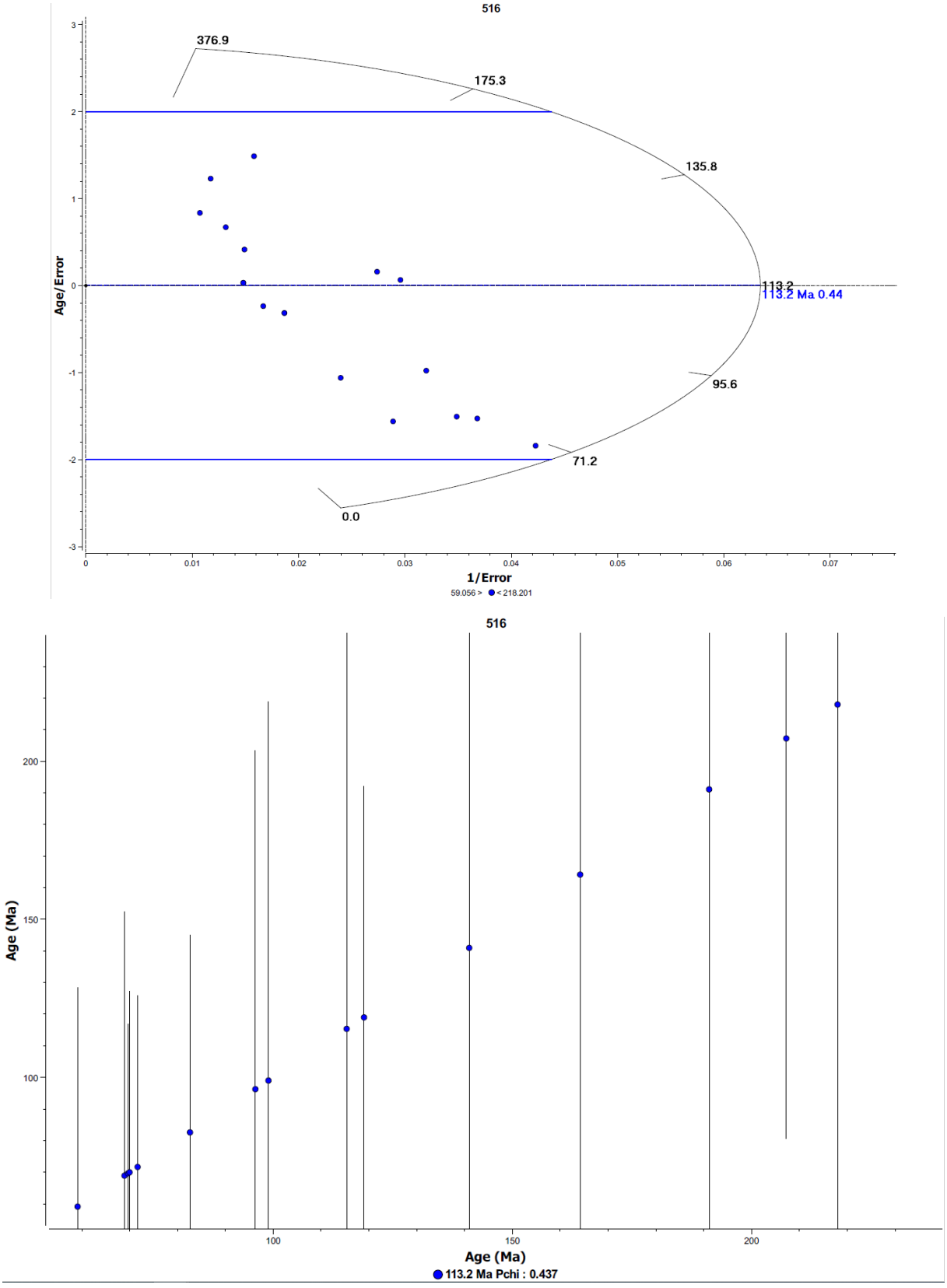


Figure S.17. Radial plot and Age vs. Age plot of AFT single grain ages for sample 192, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.

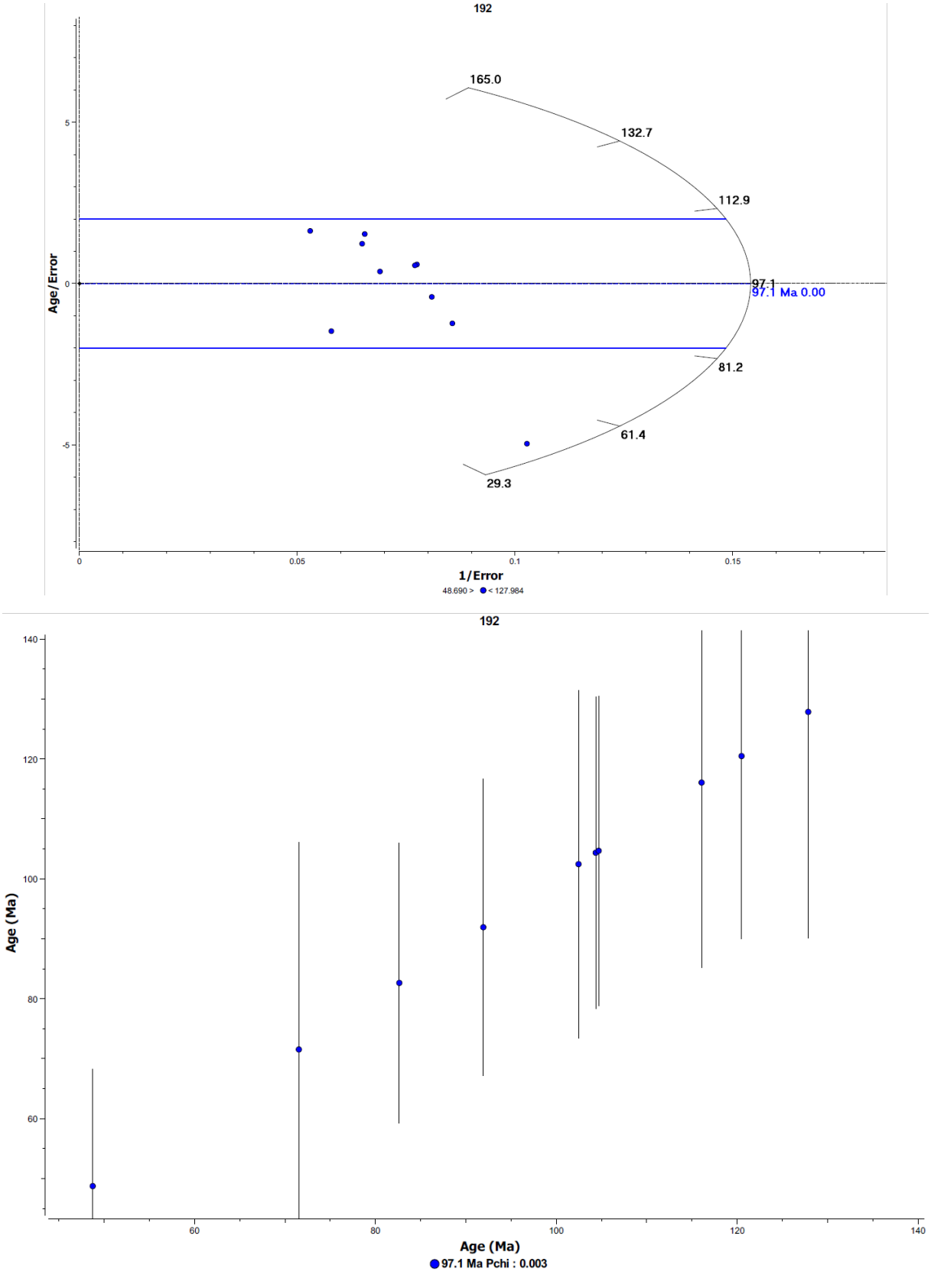


Figure S.18. Radial plot and Age vs. Age plot of AFT single grain ages for sample 124, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.

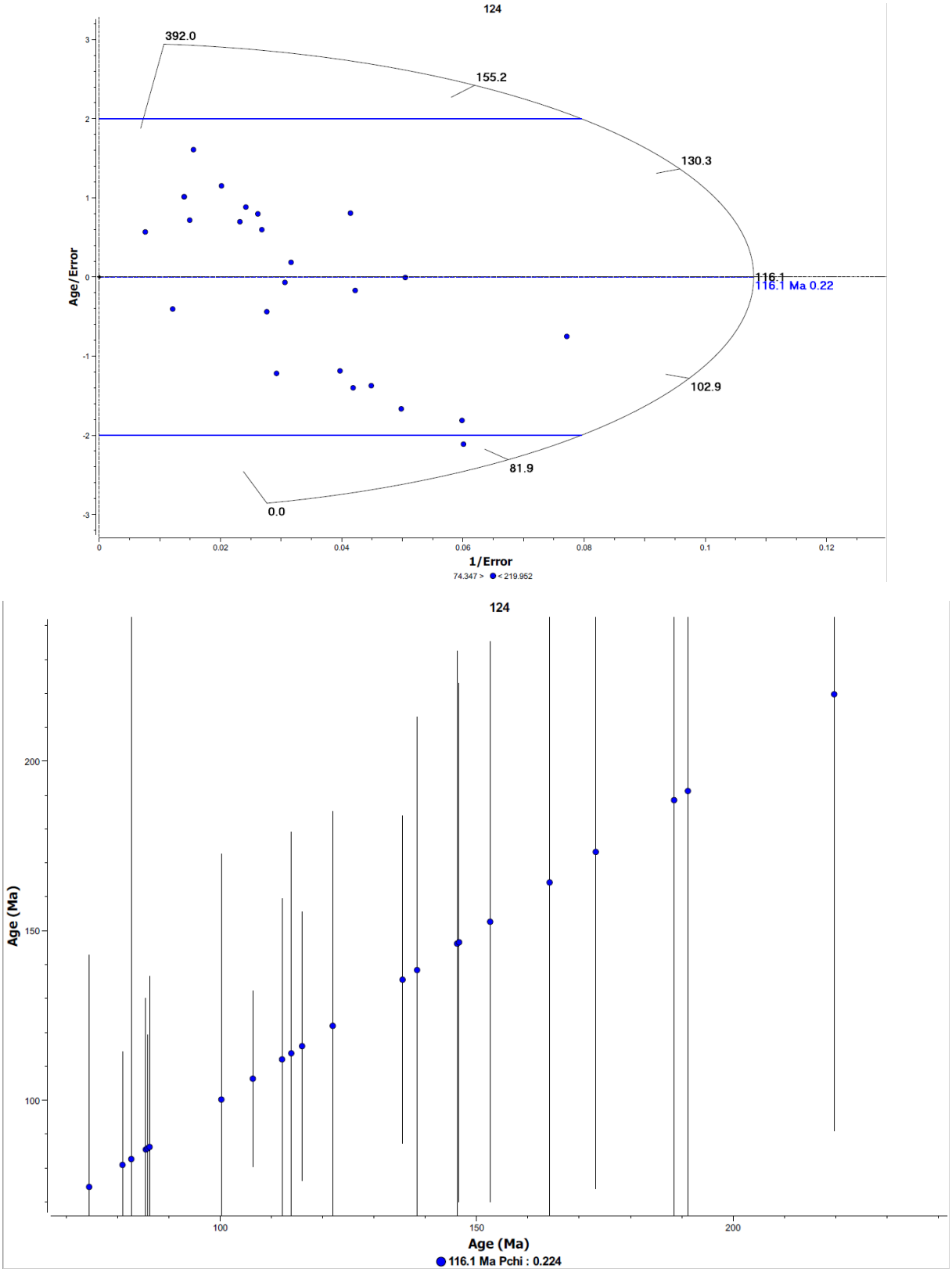


Figure S.19. Radial plot and Age vs. Age plot of AFT single grain ages for sample 134, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.

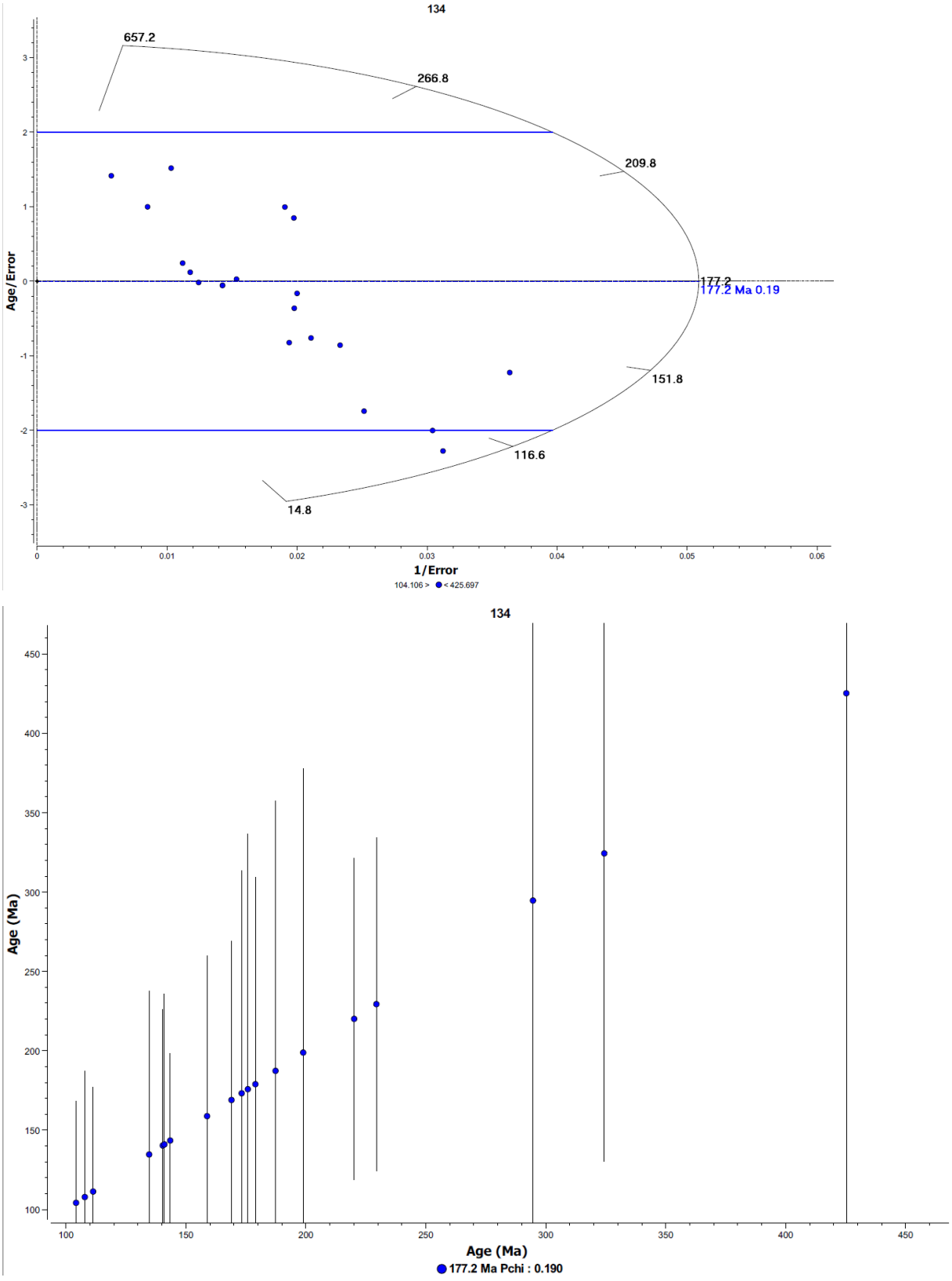
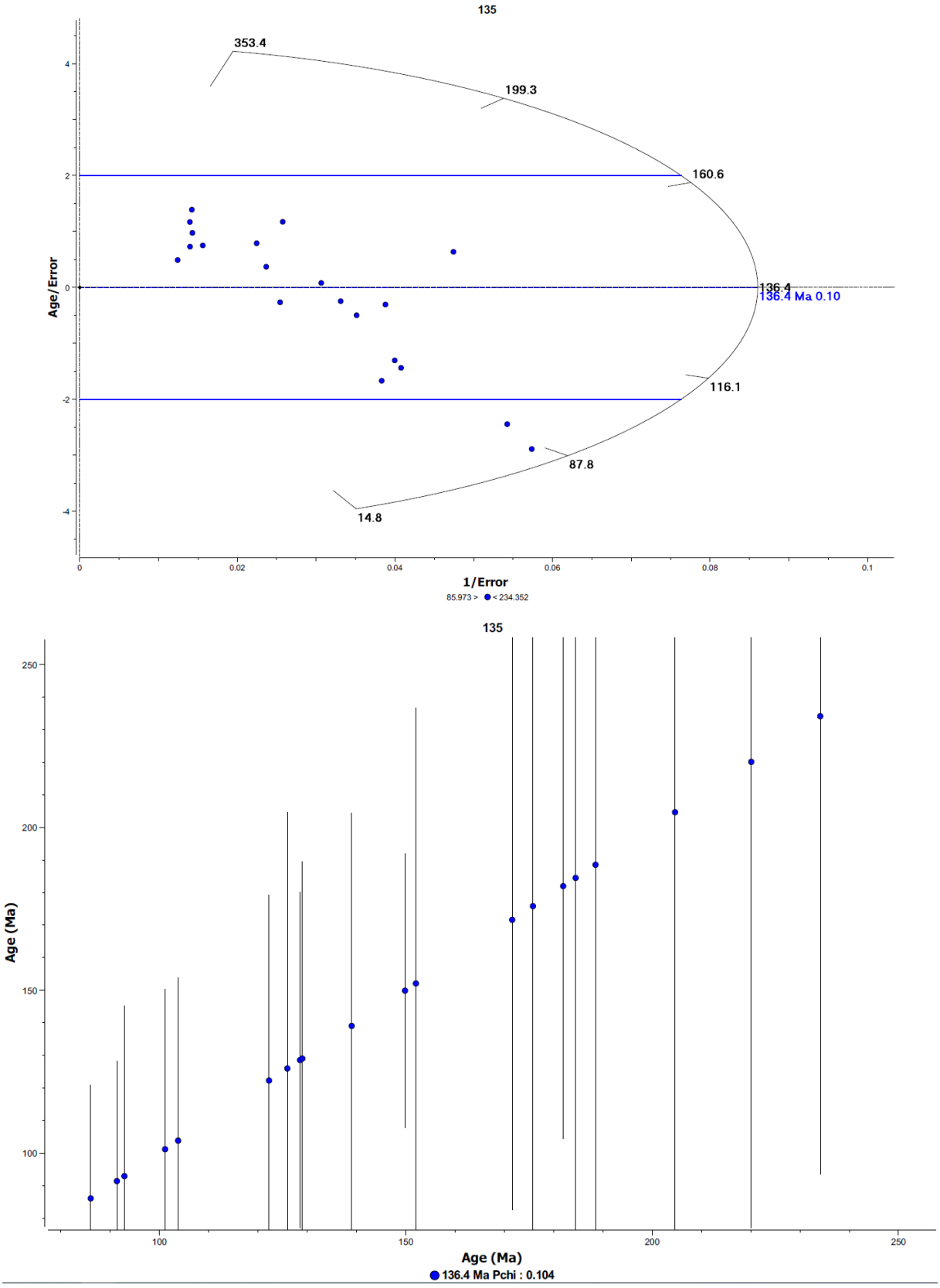


Figure S.20. Radial plot and Age vs. Age plot of AFT single grain ages for sample 135, constructed using QTQt (Gallagher, 2012). The “y” axis on the radial plot is referred in the figure with the label provided by the QTQt software. However, we acknowledge that the “y” axis in a radial plot is given by $y_j = (z_j - z_0)/\sigma(z_j)$, for $1 \leq j \leq n$, n equals the number of grains and with z_j a transformation of some data and $\sigma(z_j)$ the corresponding measurement uncertainty (Galbraith, 1988). Normally it is referred as a “standardised estimate”.



S2: Length data

Figure S.21. Raw track lengths (L) in µm and angle with c-axis (A) for sample 171.

ID	L	A	ID	L	A	ID	L	A
1	13.6	57.0	35	10.7	60.0	69	11.9	24.0
2	9.4	75.0	36	14.0	37.0	70	6.1	60.0
3	12.4	73.0	37	11.0	54.0	71	11.3	64.0
4	13.6	53.0	38	8.1	76.0	72	10.1	84.0
5	13.8	78.0	39	12.9	69.0	73	9.2	66.0
6	13.2	25.0	40	10.6	68.0	74	10.6	64.0
7	10.7	53.0	41	9.4	80.0	75	8.5	78.0
8	10.7	79.0	42	10.8	27.0	76	12.6	44.0
9	9.9	74.0	43	5.2	84.0	77	11.4	87.0
10	10.1	74.0	44	11.8	63.0	78	12.7	64.0
11	10.0	62.0	45	9.6	24.0	79	12.2	89.0
12	12.4	31.0	46	11.5	36.0	80	10.2	79.0
13	11.6	27.0	47	11.0	60.0	81	9.6	68.0
14	13.0	21.0	48	8.6	36.0	82	13.9	32.0
15	12.7	34.0	49	14.5	41.0	83	10.9	67.0
16	13.1	50.0	50	14.3	63.0	84	8.8	50.0
17	10.6	79.0	51	12.1	72.0	85	13.8	1.0
18	12.0	48.0	52	11.5	58.0	86	12.1	47.0
19	8.8	62.0	53	12.2	17.0	87	12.6	61.0
20	11.6	53.0	54	11.4	75.0	88	12.9	68.0
21	9.8	69.0	55	10.9	50.0	89	9.0	34.0
22	12.1	54.0	56	10.0	56.0	90	8.4	63.0
23	14.0	42.0	57	13.6	80.0	91	13.9	49.0
24	15.1	70.0	58	9.6	34.0	92	12.3	78.0
25	11.4	55.0	59	16.8	48.0	93	12.7	48.0
26	13.8	2.0	60	13.5	24.0	94	12.4	77.0
27	13.4	22.0	61	8.5	84.0	95	16.2	68.0
28	11.2	87.0	62	15.0	50.0	96	9.9	44.0
29	11.6	87.0	63	13.1	37.0	97	13.8	53.0
30	12.6	7.0	64	13.7	29.0	98	12.1	33.0
31	9.0	29.0	65	9.0	62.0	99	11.1	66.0
32	11.6	50.0	66	11.9	86.0	100	10.2	52.0
33	11.3	72.0	67	12.4	84.0			
34	11.1	49.0	68	13.9	55.0			

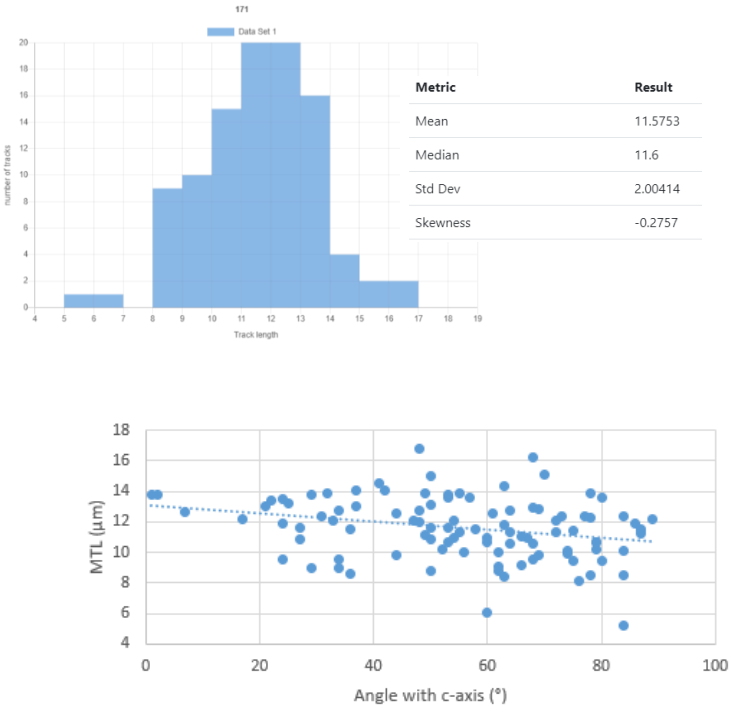


Figure S.22. Raw track lengths (L) in µm and angle with c-axis (A) for sample 175.

ID	L	A	ID	L	A	ID	L	A
1	9.6	70	35	14.4	73	69	10.8	78
2	14.7	69	36	9.7	29	70	14.1	21
3	12.7	56	37	12.7	88	71	11.4	57
4	9.4	2	38	14.0	60	72	9.3	19
5	10.0	21	39	13.3	74	73	12.1	62
6	12.7	47	40	12.8	77	74	9.7	35
7	13.3	24	41	13.2	24	75	11.2	40
8	13.4	46	42	11.9	70	76	13.9	72
9	8.7	39	43	8.5	58	77	10.4	42
10	13.1	59	44	10.3	73	78	10.3	28
11	14.6	48	45	9.0	71	79	12.9	26
12	13.1	61	46	9.0	71	80	14.5	80
13	14.6	76	47	12.1	57	81	9.5	35
14	12.4	73	48	11.7	34	82	8.5	81
15	13.6	49	49	13.7	30	83	14.8	61
16	11.6	53	50	10.9	80	84	13.3	67
17	13.4	30	51	14.2	62	85	9.1	41
18	9.3	55	52	9.3	73	86	10.4	24
19	14.3	82	53	13.2	38	87	12.5	36
20	13.1	57	54	10.8	36	88	14.0	71
21	13.0	49	55	10.8	44	89	11.1	60
22	13.4	22	56	11.4	68	90	12.8	39
23	12.6	68	57	13.4	57	91	12.1	69
24	11.5	36	58	13.7	28	92	11.9	13
25	13.0	87	59	12.9	30	93	13.6	63
26	12.5	77	60	11.4	45	94	12.4	59
27	10.9	39	61	12.7	53	95	11.8	20
28	14.3	58	62	8.0	5	96	12.8	3
29	9.7	61	63	8.5	22	97	11.9	14
30	13.3	48	64	12.0	73	98	11.3	43
31	11.5	73	65	13.4	54	99	8.7	27
32	10.3	61	66	12.0	42	100	11.6	66
33	13.3	35	67	11.9	78			
34	12.0	68	68	9.8	30			

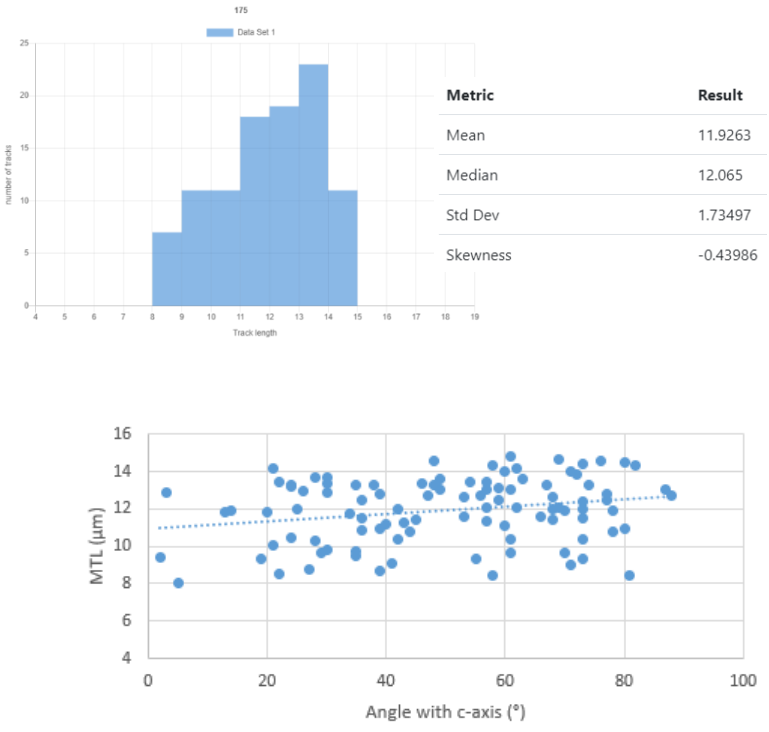


Figure S.23. Raw track lengths (L) in µm and angle with c-axis (A) for sample 176.

ID	L	A	ID	L	A	ID	L	A
1	11.3	53	35	13.2	75	69	12.5	84
2	14.8	54	36	12.2	64	70	12.5	77
3	10.9	55	37	13.4	48	71	11.0	55
4	14.1	70	38	11.9	59	72	13.3	41
5	10.6	46	39	8.1	53	73	11.9	46
6	10.7	37	40	11.7	79	74	8.4	62
7	12.8	79	41	10.8	85	75	9.5	49
8	8.2	33	42	12.0	88	76	13.2	40
9	11.3	25	43	13.0	21	77	14.5	70
10	14.4	70	44	12.2	60	78	13.4	78
11	11.7	58	45	12.2	69	79	9.7	45
12	10.9	88	46	13.8	26	80	10.5	75
13	11.5	76	47	12.8	55	81	12.2	42
14	14.4	19	48	13.2	82	82	12.5	74
15	11.6	51	49	12.6	55	83	10.7	60
16	13.4	24	50	13.4	50	84	15.1	56
17	10.3	66	51	10.5	90	85	11.4	74
18	13.2	32	52	15.1	40	86	11.1	62
19	8.6	77	53	12.6	52	87	12.1	75
20	11.4	66	54	10.7	86	88	10.6	44
21	9.2	46	55	12.7	60	89	12.1	70
22	10.5	78	56	13.5	62	90	13.2	83
23	12.6	85	57	12.7	70	91	10.8	81
24	12.9	72	58	11.6	58	92	13.6	60
25	12.2	76	59	9.4	73	93	13.4	20
26	11.9	59	60	10.3	56	94	11.3	51
27	10.1	19	61	12.0	54	95	11.0	83
28	10.7	34	62	9.0	46	96	12.3	53
29	9.8	76	63	10.2	87	97	13.2	54
30	13.6	50	64	13.6	46	98	12.2	66
31	10.5	84	65	9.7	51	99	14.5	46
32	8.1	38	66	10.3	50	100	14.0	41
33	14.0	81	67	14.5	60			
34	11.9	72	68	9.8	78			

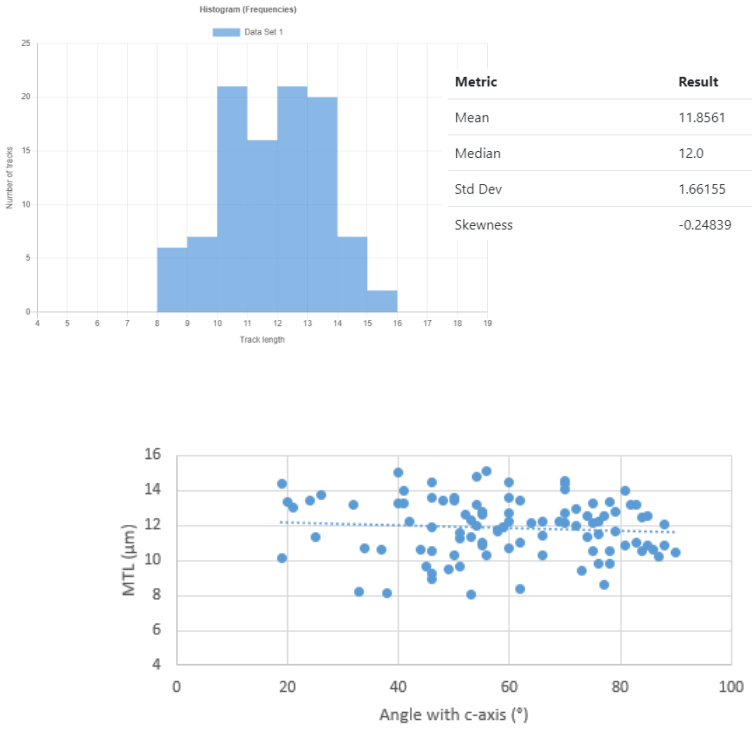


Figure S.24. Raw track lengths (L) in µm and angle with c-axis (A) for sample 180.

ID	L	A	ID	L	A	ID	L	A
1	9.1	41.00	35	8.8	73	69	13.5	73
2	11.2	50.00	36	9.2	71	70	12.8	39
3	12.6	67.00	37	11.0	53	71	13.2	30
4	13.4	69.00	38	10.6	13	72	13.8	30
5	9.2	56.00	39	10.0	66	73	11.0	74
6	9.0	43.00	40	10.5	61	74	13.1	50
7	12.2	30.00	41	13.9	77	75	15.5	34
8	11.2	55.00	42	13.6	29	76	11.8	73
9	9.2	45.00	43	13.5	76	77	11.8	67
10	10.7	51.00	44	12.6	11	78	14.3	74
11	10.8	66.00	45	14.0	74	79	13.9	33
12	10.4	71.00	46	12.1	58	80	12.8	25
13	7.9	82.00	47	12.0	50	81	10.0	68
14	9.7	28.00	48	13.9	23	82	11.1	64
15	9.3	67.00	49	10.8	87	83	12.0	53
16	8.4	70.00	50	10.5	49	84	11.7	39
17	12.8	50.00	51	12.9	55	85	12.0	40
18	12.9	58.00	52	11.8	85	86	12.9	67
19	12.5	56.00	53	9.5	49	87	12.9	65
20	12.1	36.00	54	12.7	86	88	10.1	60
21	11.3	42.00	55	13.7	29	89	12.9	86
22	12.0	45.00	56	10.9	69	90	5.6	77
23	9.8	86.00	57	10.2	58	91	13.8	67
24	11.2	68.00	58	14.2	43	92	12.4	57
25	13.9	11.00	59	12.3	65	93	9.1	84
26	12.3	75.00	60	12.3	86	94	13.4	56
27	12.4	47.00	61	12.8	1	95	11.9	35
28	12.8	42.00	62	12.6	57	96	12.1	34
29	12.1	62.00	63	13.9	32	97	14.4	25
30	11.6	82.00	64	12.4	79	98	10.2	62
31	11.4	40.00	65	11.5	63	99	12.3	48
32	8.7	60.00	66	9.9	49	100	8.7	68
33	12.1	65.00	67	13.9	72			
34	13.2	53.51	68	10.9	27			

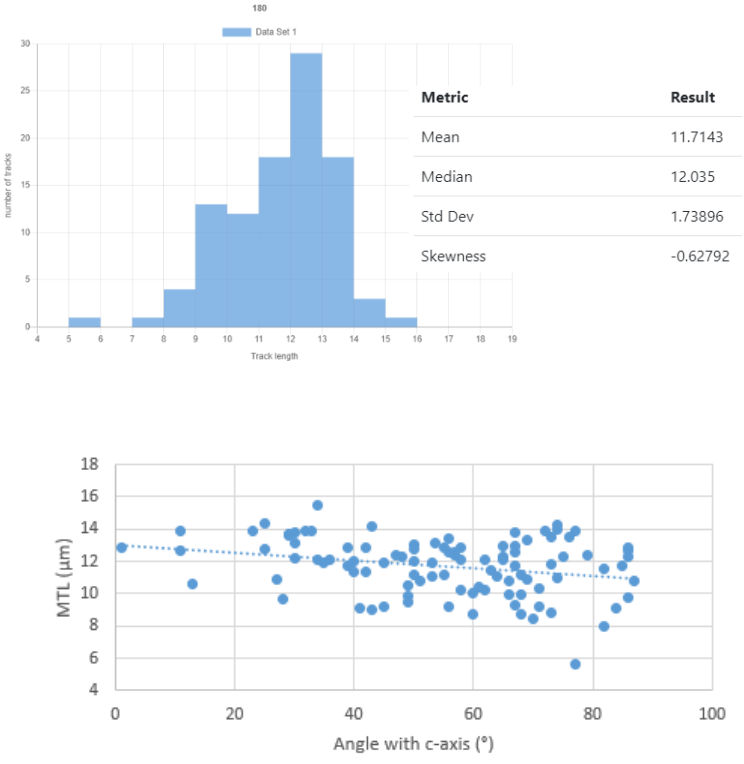


Figure S.25. Raw track lengths (L) in µm and angle with c-axis (A) for sample 182.

ID	L	A	ID	L	A	ID	L	A
1	11.2	46	35	11.5	84	69	12.3	60
2	12.0	12	36	13.5	60	70	14.4	40
3	12.5	44	37	12.3	82	71	13.5	31
4	12.2	52	38	12.5	80	72	12.3	15
5	10.7	58	39	13.9	74	73	13.9	43
6	13.3	43	40	9.7	70	74	10.8	56
7	14.3	62	41	14.1	84	75	12.9	60
8	11.7	85	42	10.5	80	76	11.5	53
9	12.7	73	43	11.9	62	77	12.2	59
10	14.4	30	44	12.9	79	78	12.4	64
11	11.4	50	45	14.1	66	79	7.8	79
12	12.7	76	46	13.7	23	80	7.8	64
13	13.1	56	47	12.9	47	81	13.2	50
14	13.9	47	48	10.4	50	82	15.7	34
15	12.2	78	49	14.2	60	83	12.5	62
16	13.4	27	50	12.2	77	84	13.3	41
17	12.4	50	51	10.9	32	85	12.2	64
18	12.6	39	52	12.8	56	86	12.8	43
19	12.5	54	53	11.6	54	87	12.7	41
20	14.0	49	54	12.7	68	88	14.8	39
21	11.9	44	55	13.2	50	89	12.7	65
22	10.3	63	56	13.6	38	90	10.1	71
23	11.8	40	57	9.2	68	91	7.7	76
24	11.2	57	58	8.3	80	92	14.6	54
25	13.3	36	59	12.2	69	93	13.1	66
26	11.9	88	60	12.8	70	94	12.9	48
27	13.7	60	61	12.9	35	95	12.2	55
28	11.3	70	62	14.8	68	96	13.0	45
29	12.7	19	63	14.6	36	97	12.2	39
30	11.9	75	64	11.4	68	98	14.3	46
31	13.6	77	65	9.5	39	99	13.1	27
32	13.6	45	66	15.7	36	100	13.1	44
33	13.6	81	67	12.0	71			
34	13.0	67	68	12.4	67			

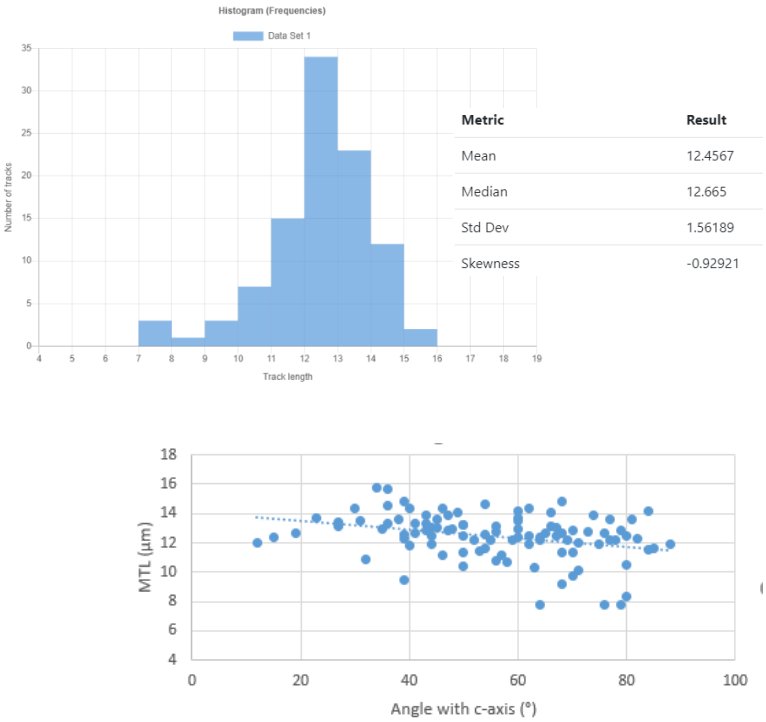


Figure S.26. Raw track lengths (L) in µm and angle with c-axis (A) for sample 164.

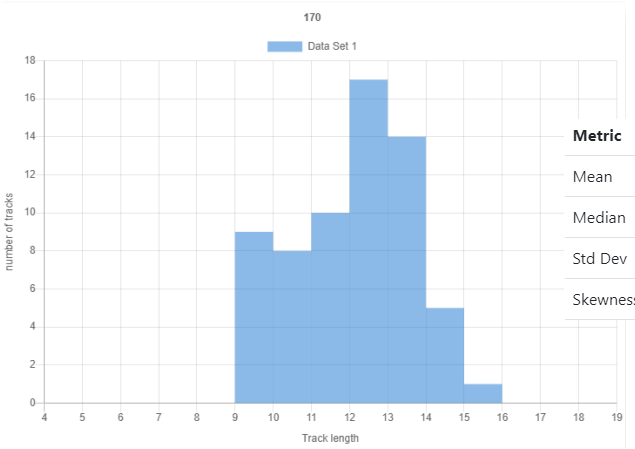
ID	L	A
1	11.1	54
2	10.3	71
3	12.3	75
4	11.0	73
5	8.0	54
6	9.2	89
7	6.7	51
8	10.2	45
9	13.8	83
10	13.3	60
11	12.7	29
12	11.8	86
13	13.3	52
14	8.8	68
15	13.7	73
16	12.2	77
17	12.8	61
18	8.8	71
19	14.7	64
20	13.5	41
21	14.2	33

Figure S.27. Raw track lengths (L) in µm and angle with c-axis (A) for sample 168.

ID	L	A
1	12.5	63
2	14.5	66
3	13.5	17
4	12.1	47
5	13.3	86
6	14.2	48
7	13.5	74
8	13.1	53
9	13.2	45
10	14.5	58
11	12.7	63
12	13.7	51
13	12.5	71
14	12.0	8
15	12.6	16
16	12.9	37
17	10.1	52
18	12.5	45
19	11.9	35
20	13.5	1
21	11.5	64
22	15.0	37
23	13.0	16
24	13.9	36
25	11.0	34
26	14.5	45
27	11.6	20

Figure S.28. Raw track lengths (L) in µm and angle with c-axis (A) for sample 170.

ID	L	A	ID	L	A
1	14.3	49	35	13.6	54
2	11.6	66	36	12.7	86
3	13.4	9	37	12.4	75
4	9.5	62	38	9.6	68
5	9.9	47	39	10.9	22
6	12.5	10	40	10.9	84
7	12.9	87	41	12.1	70
8	13.3	72	42	11.3	34
9	13.3	54	43	13.9	68
10	13.6	89	44	10.6	61
11	12.2	46	45	12.6	74
12	9.5	72	46	9.5	35
13	11.2	72	47	12.1	45
14	13.9	61	48	13.9	37
15	11.9	43	49	12.9	7
16	14.8	74	50	12.4	55
17	9.9	48	51	12.2	75
18	10.3	28	52	9.5	76
19	12.2	40	53	12.4	61
20	13.0	62	54	11.6	29
21	10.1	82	55	12.7	87
22	11.1	58	56	12.8	40
23	9.7	73	57	12.2	72
24	13.5	59	58	9.3	53
25	11.3	40	59	10.9	43
26	12.1	58	60	11.0	50
27	11.4	36	61	15.0	57
28	13.7	23	62	14.3	73
29	13.3	32	63	10.1	31
30	11.1	14	64	11.5	59
31	14.0	54	65	8.5	72
32	14.6	37	66		
33	13.0	23	67		
34	13.1	72	68		



Metric	Result
Mean	12.06672
Median	12.21
Std Dev	1.5252
Skewness	-0.14746

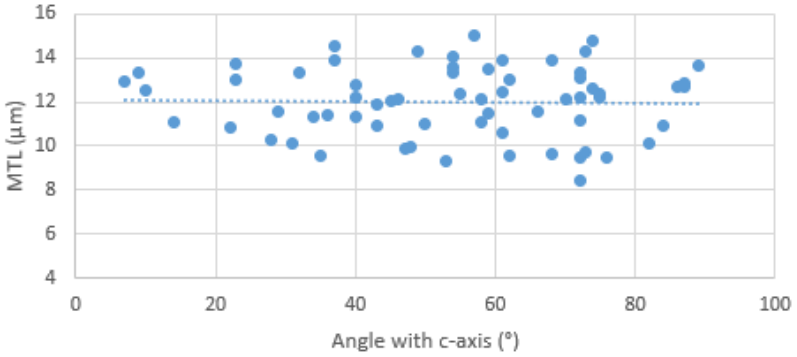


Figure S.29. Raw track lengths (L) in µm and angle with c-axis (A) for sample 501.

ID	L	A	ID	L	A
1	12.5	83	35	9.1	77
2	8.1	42	36	12.4	59
3	11.3	11.85	37	13.5	69
4	11.9	60	38	9.6	9
5	12.0	34	39	13.1	71
6	6.8	59	40		
7	10.1	27	41		
8	14.8	57	42		
9	10.5	59	43		
10	12.9	71	44		
11	14.4	50	45		
12	13.6	70	46		
13	11.3	33	47		
14	12.8	28	48		
15	13.3	64	49		
16	14.3	84	50		
17	12.9	73	51		
18	13.8	30	52		
19	11.4	67	53		
20	11.5	50	54		
21	13.5	85	55		
22	13.1	33	56		
23	14.7	71	57		
24	14.9	23	58		
25	14.0	53	59		
26	13.4	89	60		
27	14.8	84	61		
28	14.9	82	62		
29	10.4	37	63		
30	8.9	62	64		
31	12.3	8	65		
32	12.2	31	66		
33	14.2	6	67		

Figure S.30. Raw track lengths (L) in µm and angle with c-axis (A) for sample 502.

ID	L	A	ID	L	A	ID	L	A
1	14.2	45	35	12.4	26	69	10.7	80
2	9.9	75	36	9.1	65	70	10.1	37
3	7.9	48	37	14.0	45	71	12.2	41
4	13.0	54	38	13.7	65	72	12.6	47
5	10.7	56	39	15.1	54	73	11.8	77
6	13.5	76	40	11.8	42	74	13.1	48
7	10.6	65	41	11.6	45	75	12.3	45
8	9.2	75	42	11.9	48	76	13.7	9
9	9.9	57	43	13.1	21	77	13.5	23
10	10.5	73	44	13.2	31	78	12.2	12
11	13.7	58	45	13.5	88	79	12.5	31
12	12.3	54	46	11.3	49	80	9.7	43
13	11.3	78	47	12.8	89	81	11.8	35
14	11.4	61	48	11.4	66	82	12.0	36
15	11.9	77	49	10.8	80	83	12.6	54
16	11.5	64	50	9.6	48	84	11.7	52
17	9.6	49	51	13.3	88	85	11.8	74
18	13.3	50	52	12.1	73	86	13.6	54
19	10.4	73	53	10.9	57	87	12.4	68
20	10.0	62	54	12.0	52	88	12.8	42
21	13.8	56	55	12.5	88	89	11.6	71
22	12.8	71	56	11.6	86	90	14.1	41
23	11.0	59	57	10.4	42	91	12.5	72
24	12.5	45	58	11.0	85	92	11.5	70
25	11.0	79	59	13.3	69	93	12.3	80
26	11.0	76	60	12.8	62	94	11.4	80
27	10.1	52	61	14.4	48	95	11.5	69
28	14.8	73	62	11.9	85	96	11.5	40
29	12.1	61	63	14.4	44	97	14.5	53
30	12.0	56	64	7.7	74	98	11.3	30
31	13.0	51	65	8.9	28	99	12.8	50
32	7.6	60	66	13.1	49	100	9.0	73
33	10.2	31	67	11.6	47			
34	13.2	19	68	12.3	34			

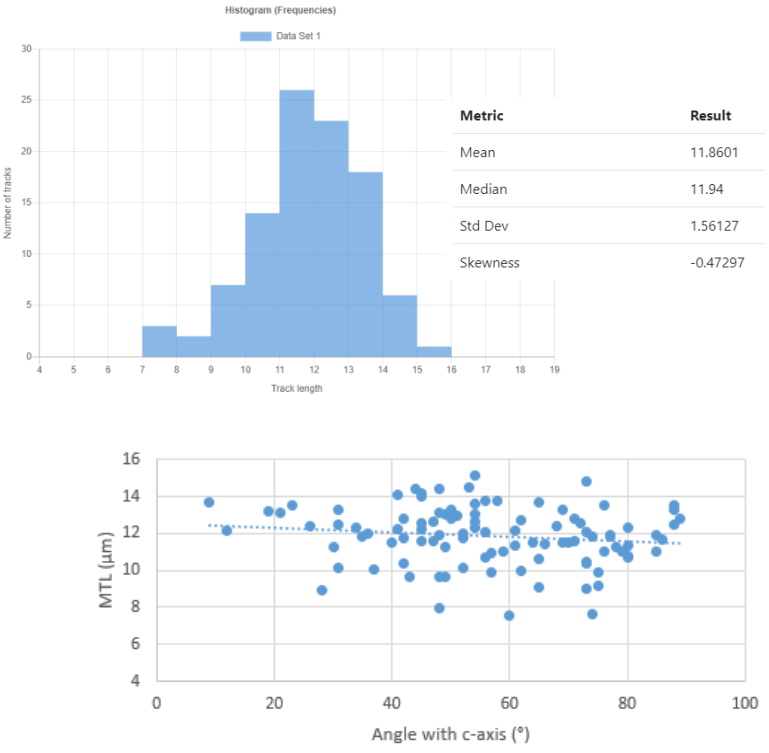


Figure S.31. Raw track lengths (L) in µm and angle with c-axis (A) for sample 505.

ID	L	A	ID	L	A	ID	L	A
1	10.1	77	35	12.6	55	69	11.2	32
2	10.0	81	36	8.7	41	70	11.0	42
3	12.0	61	37	9.1	79	71	10.6	66
4	12.1	47	38	11.4	76	72	11.1	61
5	9.9	66	39	12.4	61	73	9.6	51
6	11.4	85	40	12.4	70	74	9.6	78
7	10.0	86	41	12.5	53	75	11.1	53
8	12.0	90	42	12.6	80	76	12.0	59
9	9.1	78	43	12.4	47	77	9.2	52
10	7.6	39	44	8.3	35	78	8.1	10
11	11.8	62	45	13.1	63	79	11.9	66
12	8.3	58	46	8.1	75	80	10.8	34
13	9.0	53	47	9.3	73	81	10.7	82
14	10.7	49	48	10.0	79	82	9.5	42
15	11.7	39	49	12.1	17	83	6.9	35
16	11.3	70	50	11.8	69	84	10.9	19
17	10.7	61	51	12.6	55	85	11.7	51
18	12.8	78	52	9.5	45	86	11.7	63
19	13.0	52	53	10.9	43	87	10.5	23
20	12.5	54	54	7.7	45	88	8.0	80
21	13.2	44	55	9.2	66	89	10.3	36
22	9.3	71	56	9.1	71	90	11.8	58
23	12.3	74	57	11.5	75	91	10.1	79
24	10.1	70	58	8.7	41	92	9.9	59
25	9.2	60	59	10.1	55	93	7.5	29
26	11.4	63	60	8.0	33	94	12.2	75
27	11.7	78	61	12.4	43	95	9.3	30
28	10.7	42	62	10.0	38	96	8.5	75
29	11.1	74	63	11.2	83	97	12.0	71
30	10.2	79	64	12.3	49	98	13.9	76
31	9.2	73	65	10.4	49	99	12.1	78
32	11.9	33	66	12.5	51	100	10.5	33
33	7.0	57	67	11.2	59			
34	9.1	68	68	10.5	35			

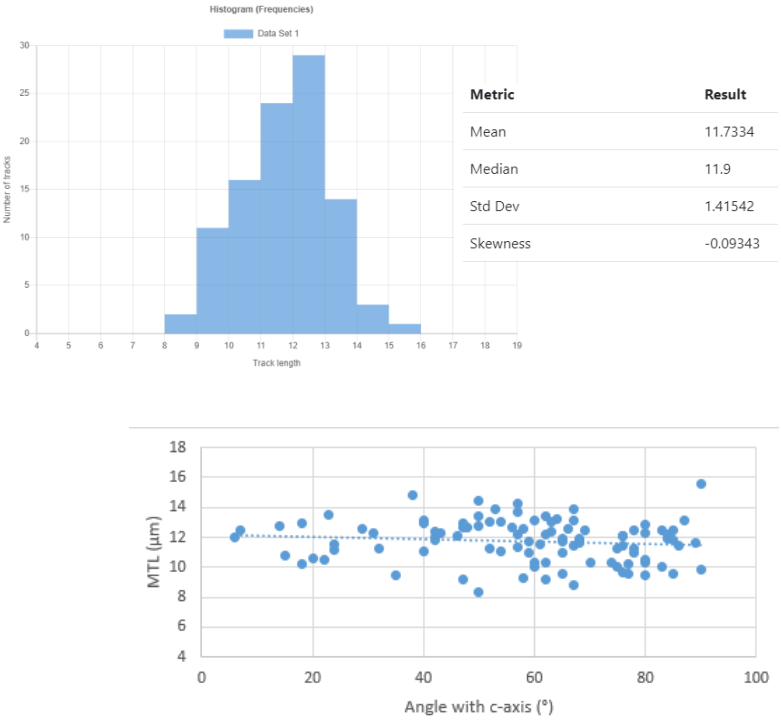


Figure S.32. Raw track lengths (L) in µm and angle with c-axis (A) for sample 506.

ID	L	A	ID	L	A	ID	L	A
1	13.7	17	35	12.2	68	69	13.0	74
2	9.8	62	36	12.8	29	70	10.4	82
3	9.1	60	37	11.6	71	71	10.3	33
4	7.3	38	38	14.1	80	72	14.0	29
5	11.6	48	39	11.6	60	73	11.2	55
6	8.4	59	40	9.6	63	74	10.6	46
7	11.5	82	41	11.4	49	75	13.4	46
8	9.7	49	42	10.4	39	76	13.3	40
9	13.9	28	43	15.8	73	77	11.1	21
10	11.9	39	44	10.8	70	78	12.7	69
11	10.9	49	45	12.3	63	79	13.1	28
12	13.4	39	46	12.7	31	80	14.0	62
13	10.7	26	47	10.1	60	81	11.7	78
14	14.8	36	48	12.2	78	82	12.2	70
15	12.0	19	49	14.0	30	83	11.7	75
16	13.8	69	50	12.9	25	84	12.9	58
17	11.8	59	51	13.8	34	85	9.0	58
18	11.0	83	52	14.0	49	86	14.3	19
19	13.7	45	53	11.6	35	87	12.4	74
20	14.3	41	54	13.3	20	88	12.1	74
21	12.1	66	55	14.4	50	89	12.7	76
22	12.3	58	56	11.5	83	90	9.7	38
23	10.8	2	57	13.0	60	91	12.6	57
24	13.7	75	58	12.3	54	92	11.4	60
25	10.8	73	59	12.5	53	93	13.2	51
26	12.1	70	60	11.6	40	94	10.1	67
27	14.8	37	61	14.2	74	95	13.5	72
28	12.4	66	62	12.1	57	96	13.4	43
29	14.4	35	63	12.5	69	97	13.9	83
30	14.6	74	64	11.2	57	98	13.3	23
31	12.4	77	65	14.0	26	99	14.4	15
32	14.0	23	66	12.6	69	100	12.7	65
33	8.2	50	67	13.1	64			
34	11.6	24	68	11.5	84			

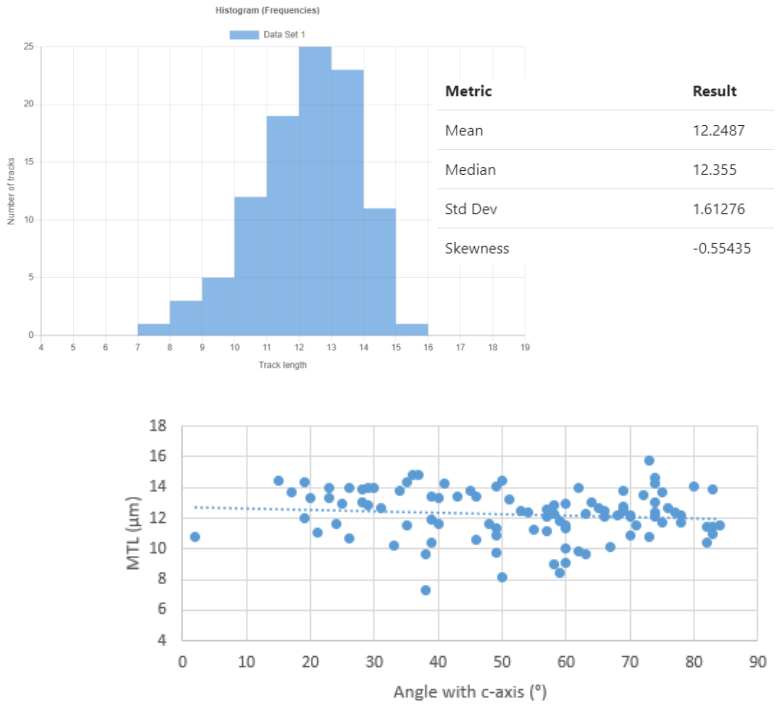


Figure S.33. Raw track lengths (L) in µm and angle with c-axis (A) for sample 510.

ID	L	A	ID	L	A	ID	L	A
1	11.0	64	35	12.4	67	69	8.7	54
2	12.9	51	36	13.2	67	70	13.2	78
3	10.2	56	37	10.8	67	71	13.0	53
4	13.5	50	38	16.8	74	72	12.3	27
5	9.8	56	39	10.1	61	73	14.6	73
6	14.5	45	40	10.5	69	74	15.8	29
7	13.5	56	41	14.5	76	75	11.9	73
8	11.4	41	42	11.2	75	76	14.1	32
9	10.6	37	43	12.5	66	77	11.2	74
10	12.1	39	44	14.4	63	78	13.3	70
11	11.8	51	45	13.6	78	79	10.3	62
12	13.4	49	46	10.9	62	80	10.9	60
13	12.4	53	47	14.2	64	81	10.9	52
14	10.2	83	48	12.5	48	82	13.1	78
15	14.8	55	49	10.4	89	83	10.2	45
16	14.3	75	50	12.2	82	84	12.1	70
17	13.9	52	51	11.2	89	85	13.1	73
18	14.4	48	52	11.7	55	86	13.7	34
19	13.6	36	53	12.4	76	87	13.8	62
20	13.0	74	54	12.9	14	88	12.9	76
21	8.3	71	55	9.8	73	89	11.6	37
22	13.1	73	56	11.5	38	90	11.8	45
23	14.9	53	57	11.4	77	91	11.8	83
24	13.1	85	58	13.3	48	92	10.1	80
25	12.8	71	59	10.9	32	93	12.1	79
26	11.7	72	60	12.6	47	94	12.1	54
27	11.8	82	61	11.4	66	95	14.3	77
28	11.5	64	62	11.6	55	96	12.4	28
29	12.5	63	63	11.1	58	97	13.3	72
30	11.9	75	64	13.4	40	98	13.5	53
31	13.1	82	65	13.2	30	99	12.1	85
32	9.1	44	66	12.0	83	100	14.2	67
33	13.0	59	67	14.3	56			
34	12.3	45	68	11.0	43			

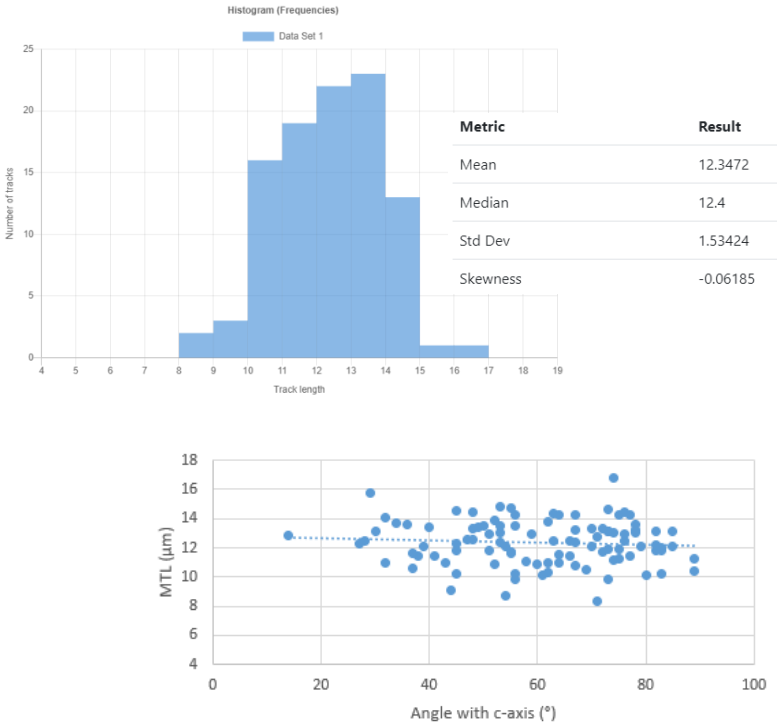
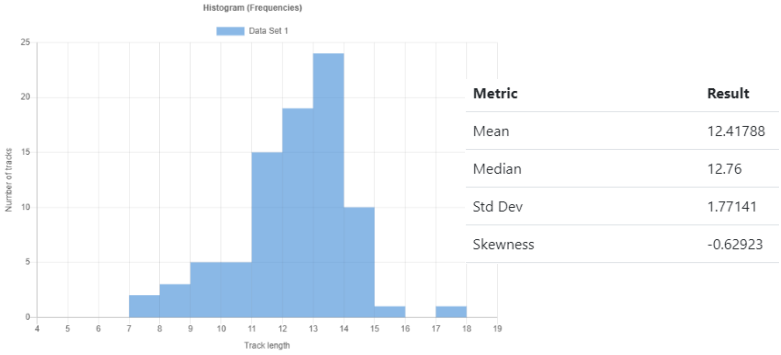


Figure S.34. Raw track lengths (L) in µm and angle with c-axis (A) for sample 512.

ID	L	A	ID	L	A
1	10.2	85	35	13.6	57
2	10.2	79	36	13.1	79
3	12.5	60	37	9.2	88
4	14.4	41	38	13.1	21
5	12.2	55	39	12.1	7
6	11.8	73	40	9.7	66
7	13.3	85	41	11.3	36
8	14.1	57	42	13.2	43
9	14.2	69	43	13.8	53
10	12.0	82	44	11.8	74
11	12.6	85	45		
12	15.9	88	46		
13	12.1	61	47		
14	11.8	82	48		
15	13.4	0	49		
16	12.6	84	50		
17	13.7	87	51		
18	13.5	59	52		
19	10.2	81	53		
20	13.6	12	54		
21	14.9	49	55		
22	10.6	89	56		
23	11.6	49	57		
24	12.2	72	58		
25	13.3	89	59		
26	12.5	44	60		
27	13.2	64	61		
28	13.4	57	62		
29	11.0	84	63		
30	10.8	85	64		
31	12.2	66	65		
32	15.6	55	66		
33	12.2	26	67		
34	13.0	19	68		

Figure S.35. Raw track lengths (L) in µm and angle with c-axis (A) for sample 515.

ID	L	A	ID	L	A	ID	L	A
1	13.2	44	35	10.9	59	69	13.3	54
2	14.8	33	36	10.6	23	70	11.8	58
3	11.6	73	37	11.9	64	71	13.4	77
4	14.2	70	38	13.2	63	72	7.9	79
5	13.7	17	39	10.9	57	73	11.2	46
6	12.6	56	40	9.2	54	74	14.9	77
7	12.1	82	41	11.7	26	75	12.6	54
8	13.0	63	42	11.2	38	76	12.8	56
9	14.1	50	43	13.5	35	77	13.8	62
10	12.0	32	44	14.6	40	78	12.9	80
11	11.8	38	45	9.1	57	79	13.7	77
12	11.4	46	46	13.7	17	80	13.4	78
13	10.6	59	47	12.3	41	81	13.6	62
14	14.0	58	48	12.0	37	82	12.8	80
15	13.9	59	49	10.4	70	83	9.9	75
16	12.9	54	50	13.3	52	84	13.9	1
17	11.4	34	51	7.7	62	85	12.9	76
18	12.1	56	52	11.7	80	86		
19	11.7	72	53	12.5	75	87		
20	11.3	55	54	13.2	50	88		
21	12.2	45	55	13.8	28	89		
22	13.9	60	56	13.8	61	90		
23	17.1	15	57	12.8	32	91		
24	9.7	28	58	14.6	20	92		
25	12.3	28	59	11.1	65	93		
26	8.6	75	60	12.1	58	94		
27	14.4	35	61	15.4	58	95		
28	8.3	63	62	8.7	40	96		
29	12.7	52	63	13.6	67	97		
30	10.0	89	64	14.3	77	98		
31	14.0	61	65	13.4	21	99		
32	13.6	53	66	14.4	26	100		
33	12.6	60	67	13.1	59			
34	13.0	61	68	11.3	80			



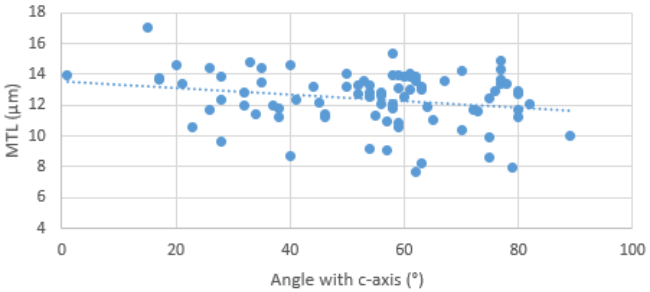


Figure S.36. Raw track lengths (L) in µm and angle with c-axis (A) for sample 516.

ID	L	A
1	13.0	39
2	11.9	39
3	11.1	55
4	7.6	79
5	9.0	79
6	12.0	89
7	10.1	72
8	11.6	61
9	13.3	28
10	12.3	49
11	12.3	40
12	12.8	75
13	12.4	56
14	12.8	44
15	12.3	71
16	10.7	49
17	13.3	78
18	8.9	23
19	10.6	55
20	13.5	60
21	12.5	78
22	13.3	42
23	11.8	42
24	11.8	81
25	12.3	77
26	13.3	63
27	10.6	23
28	14.3	14
29	13.3	82

Figure S.37. Raw track lengths (L) in µm and angle with c-axis (A) for sample 192.

ID	L	A	ID	L	A
1	10.2	44	35	11.6	81
2	11.8	64	36	11.8	66
3	14.3	26	37	11.7	70
4	14.0	59	38	12.1	2
5	9.6	84	39	13.6	68
6	13.3	41	40	10.0	74
7	14.3	79	41	9.5	2
8	10.1	62	42	13.6	57
9	10.9	81	43	13.4	78
10	11.5	62	44	9.8	23
11	11.4	69	45	11.9	67
12	11.3	37	46	12.5	89
13	12.3	52	47	13.6	50
14	12.7	71	48		
15	12.0	20	49		
16	13.2	14	50		
17	13.0	52	51		
18	11.6	23	52		
19	11.2	67	53		
20	15.0	29	54		
21	11.5	70	55		
22	8.6	53	56		
23	13.3	26	57		
24	10.1	33	58		
25	12.1	39	59		
26	13.4	8	60		
27	12.3	53	61		
28	13.7	5	62		
29	11.4	56	63		
30	14.1	39	64		
31	11.2	8	65		
32	12.6	53	66		
33	15.2	5	67		
34	14.8	56	68		

Figure S.38. Raw track lengths (L) in µm and angle with c-axis (A) for sample 124.

ID	L	A	ID	L	A	ID	L	A
1	13.7	51	35	13.2	79	69	12.4	67
2	13.3	49	36	12.3	39	70	14.0	48
3	11.2	18	37	11.3	74	71	13.0	66
4	12.4	41	38	12.7	78	72		
5	10.3	60	39	12.1	50	73		
6	12.4	82	40	13.4	19	74		
7	11.2	70	41	10.2	86	75		
8	11.6	79	42	11.0	45	76		
9	8.3	89	43	12.4	39	77		
10	12.5	47	44	11.9	60	78		
11	12.2	72	45	9.2	50	79		
12	13.8	44	46	10.2	70	80		
13	13.7	73	47	13.7	62	81		
14	14.9	67	48	8.0	78	82		
15	14.7	59	49	11.3	54	83		
16	11.0	84	50	14.6	57	84		
17	12.9	71	51	12.5	33	85		
18	12.6	14	52	12.3	36	86		
19	11.0	25	53	12.2	70	87		
20	13.0	89	54	11.5	37	88		
21	14.1	73	55	11.9	28	89		
22	13.0	77	56	12.2	45	90		
23	12.4	36	57	12.6	81	91		
24	11.0	36	58	11.5	55	92		
25	12.4	39	59	13.7	61	93		
26	8.9	61	60	10.1	22	94		
27	10.7	61	61	13.9	45	95		
28	9.3	72	62	12.7	62	96		
29	11.9	52	63	11.0	22	97		
30	11.2	39	64	11.0	60	98		
31	14.9	61	65	9.4	51	99		
32	10.2	61	66	13.1	31	100		
33	9.4	72	67	12.8	6			
34	13.9	52	68	12.3	70			

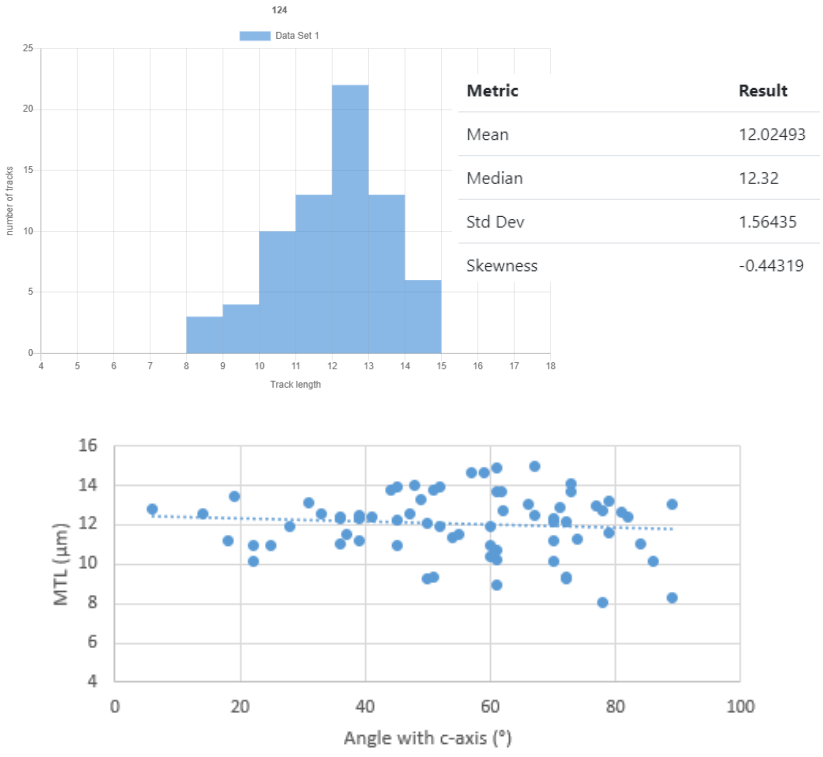


Figure S.39. Raw track lengths (L) in µm and angle with c-axis (A) for sample 134.

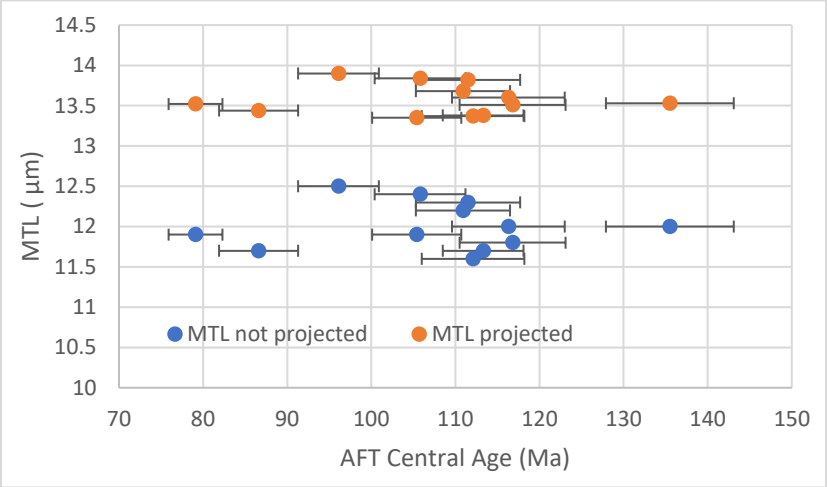
ID	L	A
1	11.9	70
2	13.7	41
3	13.5	71
4	13.3	42
5	11.7	73
6	12.8	68
7	13.0	52
8	13.1	69
9	14.2	44
10	10.1	32
11	10.3	63
12	12.2	38
13	11.1	71
14	11.9	78
15	12.8	41
16	12.9	77
17	14.0	65
18	10.6	63
19	11.4	74
20	12.8	77
21	13.0	46

Figure S.40. Raw track lengths (L) in µm and angle with c-axis (A) for sample 135.

ID	L	A	ID	L	A
1	14.3	33	35	12.1	78
2	14.5	9	36		
3	14.2	24	37		
4	13.8	60	38		
5	10.9	89	39		
6	11.4	45	40		
7	14.4	57	41		
8	13.0	86	42		
9	13.8	60	43		
10	12.7	54	44		
11	12.5	41	45		
12	14.5	67	46		
13	11.6	46	47		
14	11.6	42	48		
15	14.1	52	49		
16	10.6	52	50		
17	13.4	51	51		
18	12.7	40	52		
19	11.6	41	53		
20	16.0	14	54		
21	11.1	51	55		
22	12.1	52	56		
23	15.0	54	57		
24	14.9	51	58		
25	13.4	67	59		
26	14.3	53	60		
27	13.7	61	61		
28	13.4	42	62		
29	13.1	55	63		
30	12.4	67	64		
31	12.8	53	65		
32	13.0	61	66		
33	16.0	42	67		
34	13.0	55	68		

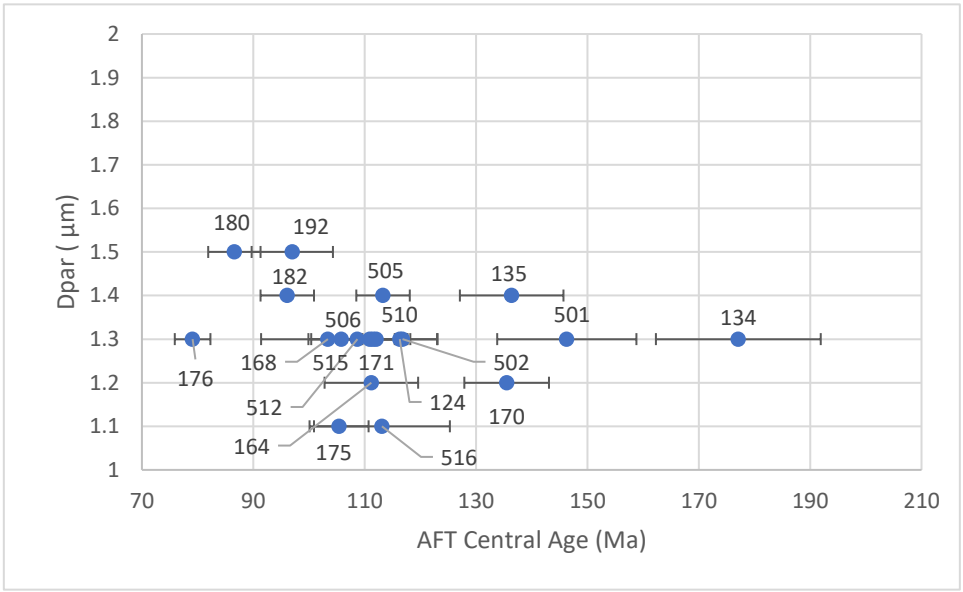
S3: Supporting graphs

Figure S.41. AFT central age vs. MTL or “boomerang” plot (Green et al., 1986).



Sample	Central age	Erro Age	MTL	MTL c-axis
124	116.3	6.7	12.0	13.6
170	135.5	7.6	12.0	13.5
171	112.1	6.1	11.6	13.4
175	105.4	5.3	11.9	13.4
176	79.1	3.2	11.9	13.5
180	86.6	4.7	11.7	13.4
182	96.1	4.8	12.5	13.9
502	116.8	6.3	11.8	13.5
505	113.3	4.8	11.7	13.4
506	110.9	5.6	12.2	13.7
510	111.5	6.2	12.3	13.8
515	105.8	5.4	12.4	13.8

Figure S.42. AFT central age vs. D_{par}.



S4: Modeling

Modeling Strategy:

Present-day temperature set to 30 ± 5 °C.

- Modeling all samples:
  - **M1:** C-axis projected lengths, constrained in one box (1250 ± 50 Ma; 350 ± 50°C), default priors.
- Modeling one representative samples (171):
  - **M2:** C-axis projected lengths, constrained in one box (1250 ± 50 Ma; 350 ± 50°C), default priors.
  - **M3:** C-axis projected lengths, constrained in one box (1250 ± 50 Ma; 350 ± 50°C), wider priors (300 ± 300 Ma; 150 ± 150°C).
  - **M4:** C-axis projected lengths, constrained in two boxes (1250 ± 50 Ma; 350 ± 50°C and 200 ± 20 Ma; 200 ± 20°C) , default priors.
  - **M5:** C-axis projected lengths, constrained in two boxes (1250 ± 50 Ma; 350 ± 50°C and 200 ± 20 Ma; 50 ± 5°C) , default priors.
  - **M6:** No c-axis projected lengths, no constraints, default priors.
- Modeling ALL samples together:
  - **M7:** C-axis projected lengths, constrained in one box (1250 ± 50 Ma; 350 ± 50°C), default priors.
  - **M8:** No c-axis projected lengths, constrained in one box (1250 ± 50 Ma; 350 ± 50°C), default priors.

Table S.1: Table with result parameters of the modeling. According to Gallagher (2012) the acceptance rate for the time and temperature should be between ~20% and 60%, and the "birth" and "death" should have a similar value. The table show the values in green, if these conditions are reached. Ac: acceptance rates.

171	*M2*	*M3*	*M4*	*M5*	*M6*
Ac(Time)	0.5546	0.6214	0.6167	0.6560	0.6871
Ac(Temperature)	0.1741	0.1746	0.3378	0.2987	0.4129
Birth	0.0385	0.0236	0.0800	0.0766	0.2205
Death	0.4566	0.6483	0.0996	0.1668	0.2219
ALL together	*Ac(Time)*	*Ac(temp.)*	*Birth*	*Death*	
M7	0.3737	0.2688	0.0783	0.0774	
M8	0.3345	0.3150	0.0502	0.498	

Figure S.43: Graphic results for every sample in modeling setting M1.

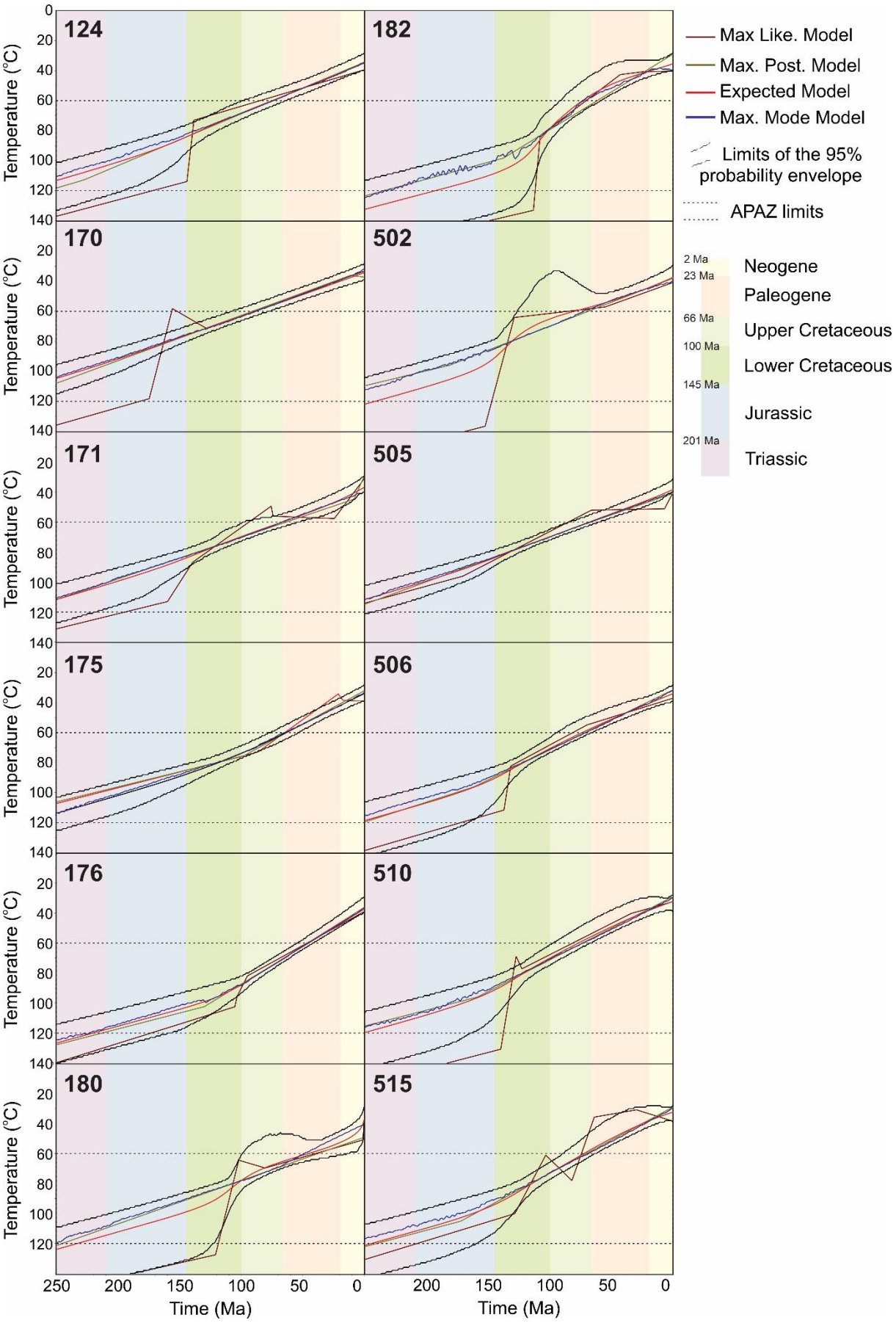


Figure S.44: Graphic results for sample 171 in modeling setting M2, M3, M4, M5, and M6.

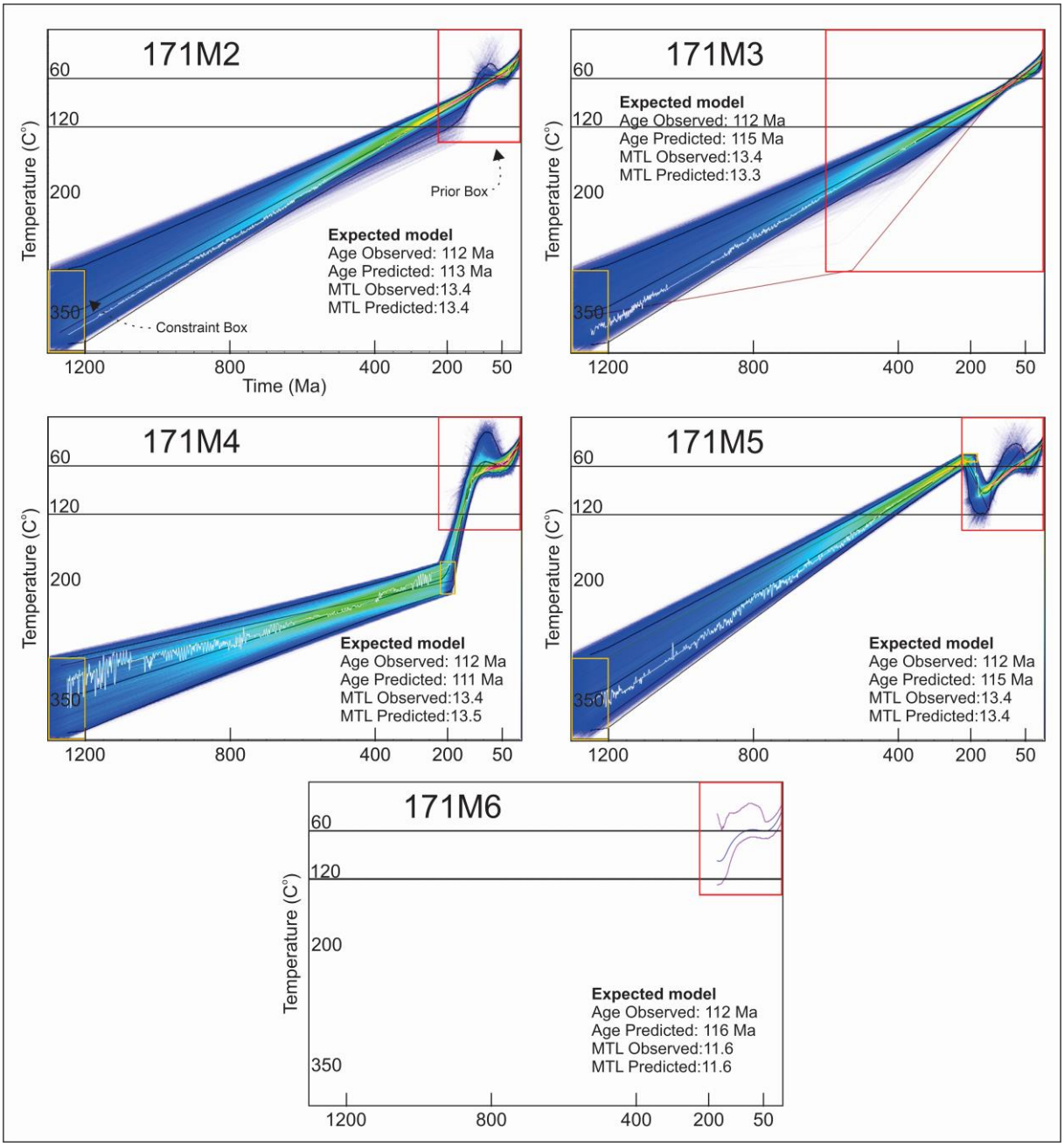


Figure S.45: Graphic results for all samples modeled together in setting M7.

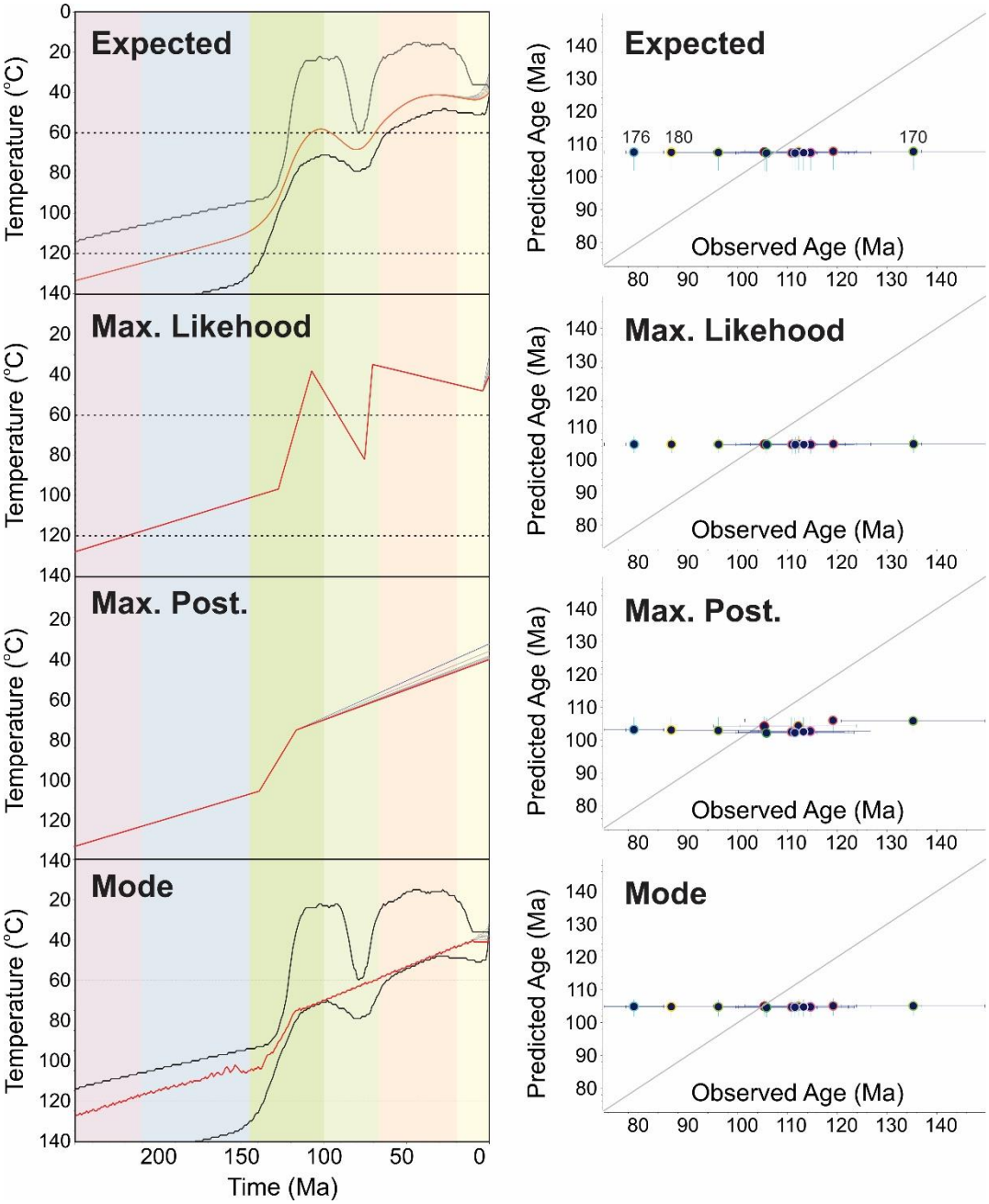


Figure S.46: Graphic results for all samples modeled together in setting M8.