Electrometer current calibration report for file: exp117030

CRC32 file validation = TRUE (ok.lines=231, not.ok.lines=0)

Consistency between index and number of lines in data file = FALSE

> Notes made during the analysis:

Current 23-step procedure

> End of notes.

item	value
File	exp117030
Cal. note	Cal-session-20 Current source = K6430
Model (electrometer)	'PTW-UNIDOS2-2.04'
SN (electrometer)	776
Range (electrometer)	1
Range of current supplied (min / max)	-10.0 nA / 10.0 nA
Cable (data file)	'DTU-10528/DTU-10033'
Measurement time: start – stop	'12-10-2019 – 10:12:45' – '12-10-2019 – 11:36:41'
Duration	83.94 min
Measured current variable (raw):	nA.read1
Meas. current k.elec.predefined (prior information)	1.0000000
Meas. current multiplier to get nA	1.0000000
Applied input bias current correction (capped-off input read.)	0.0 fA
Reference current basis (raw):	nA.K6430
Ref. source calibration factor (nA pr. unit of ref. basis)	0.9997000
Grouping variable:	nA.K6430.setpoint
Lab. temperature	22.75 degC
Lab. humidity	40.8 %RH
Lab. pressure	1001.38 hPa
k.elec.all (all data pooled; stat.limit = 25 %)	0.999617 nA/nA sd = 0.008 % N = 16
k.elec.pos (positive current only)	0.999647 nA/nA sd = 0.006 % N = 8
k.elec.neg (negative current only)	0.999587 nA/nA sd = 0.008 % N = 8
Polarity ratio: k.pol = k.elec.pos / k.elec.neg	1.00006
Polarity difference : k.elec.pos – k.elec.neg (ANOVA)	0.000060 +/- 0.000036 p = 0.121
Reference polarity for k.non.lin coeff.	Negative (k.elec.neg)
Current at setpoint zero	0.00 fA sd = 0.00 fA N = 27

item	value
File	exp117030 _____
Cal. note	Cal-session-20 Current source = K6430 _____
Model (electrometer)	'PTW-UNIDOS2-2.04' _____
SN (electrometer)	776 _____
Range (electrometer)	1 _____
Range of current supplied (min / max)	-10.0 nA / 10.0 nA _____
UPARM.current.u.base.abs	0.000000 _____
UPARM.current.u.base.pct	0.049000 _____
UPARM.current.u.minimum.step.abs	0.000000 _____
UPARM.current.u.minimum.step.pct	0.050000 _____
UPARM.current.u.input.bias.fA	20.000000 _____
UPARM.AGGREGATE.current.u.minimum.abs	0.000000 _____
UPARM.AGGREGATE.current.u.minimum.pct	0.050000 _____
k.elec.all (all data pooled; stat.limit = 25 %)	0.999617 nA/nA sd = 0.008 % N = 16 _____
k.elec.pos (positive current only)	0.999647 nA/nA sd = 0.006 % N = 8 _____
k.elec.neg (negative current only)	0.999587 nA/nA sd = 0.008 % N = 8 _____
UAGGREGATE.k.elec.all	0.001011 (k=2) _____
UAGGREGATE.k.elec.pos	0.001007 (k=2) _____
UAGGREGATE.k.elec.neg	0.001013 (k=2) _____

Electrometer current calibration (3 digits): 'PTW-UNIDOS2-2.04'SN776 (exp117030)

Non-linearity correction factors (reference = k.elec.neg; Negative) :

nA.select	nA.ref	sd.pct.nA.ref	nA.meas	sd.pct.nA.meas	N	u.k.elec.step	k.elec.step	k.non.lin
-10	-9.997	-0.00	-10.000	0.00	9.000	0.000	1.000	1
-9	-8.997	-0.00	-9.001	0.00	9.000	0.000	1.000	1
-8	-7.998	-0.00	-8.001	0.00	9.000	0.000	1.000	1
-7	-6.998	-0.00	-7.001	0.00	9.000	0.000	1.000	1
-6	-5.999	-0.00	-6.001	0.00	9.000	0.000	1.000	1
-5	-4.999	-0.00	-5.001	0.00	9.000	0.000	1.000	1
-4	-3.999	-0.00	-4.001	0.00	9.000	0.000	1.000	1
-3	-2.999	-0.00	-3.001	0.00	9.000	0.000	0.999	1
-2	-1.999	-0.00	-2.000	0.00	9.000	0.000	1.000	1
-1	-1.000	-0.00	-1.000	0.00	9.000	0.000	1.000	1
1	1.000	0.00	1.000	0.01	9.000	0.000	1.000	1
2	1.999	0.00	1.999	0.00	9.000	0.001	1.000	1
3	2.999	0.00	3.000	0.00	9.000	0.000	1.000	1
4	3.999	0.00	4.000	0.00	9.000	0.000	1.000	1
5	4.999	0.00	5.000	0.00	9.000	0.000	1.000	1
6	5.998	0.00	6.000	0.00	9.000	0.000	1.000	1
7	6.998	0.00	7.001	0.00	9.000	0.000	1.000	1
8	7.998	0.00	8.001	0.00	9.000	0.000	1.000	1
9	8.997	0.00	9.001	0.00	9.000	0.000	1.000	1
10	9.997	0.00	10.000	0.00	9.000	0.000	1.000	1

Electrometer current calibration (4 digits): 'PTW-UNIDOS2-2.04'SN776 (exp117030)

Non-linearity correction factors (reference = k.elec.neg; Negative) :

nA.select	nA.ref	sd.pct.nA.ref	nA.meas	sd.pct.nA.meas	N	u.k.elec.step	k.elec.step	k.non.lin
-10	-9.9972	-0.00	-10.0000	0.00	9.0000	0.0005	0.9997	1
-9	-8.9974	-0.00	-9.0010	0.00	9.0000	0.0005	0.9996	1
-8	-7.9979	-0.00	-8.0010	0.00	9.0000	0.0005	0.9996	1
-7	-6.9985	-0.00	-7.0010	0.00	9.0000	0.0005	0.9996	1
-6	-5.9986	-0.00	-6.0010	0.00	9.0000	0.0005	0.9996	1
-5	-4.9987	-0.00	-5.0010	0.00	9.0000	0.0005	0.9995	1
-4	-3.9992	-0.00	-4.0010	0.00	9.0000	0.0005	0.9995	1
-3	-2.9993	-0.00	-3.0010	0.00	9.0000	0.0005	0.9994	1
-2	-1.9993	-0.00	-2.0000	0.00	9.0000	0.0005	0.9996	1
-1	-0.9997	-0.00	-1.0000	0.00	9.0000	0.0005	0.9997	1
1	0.9997	0.00	1.0000	0.01	9.0000	0.0005	0.9997	1
2	1.9991	0.00	1.9990	0.00	9.0000	0.0007	1.0000	1
3	2.9990	0.00	3.0000	0.00	9.0000	0.0005	0.9997	1
4	3.9988	0.00	4.0000	0.00	9.0000	0.0005	0.9997	1
5	4.9985	0.00	5.0000	0.00	9.0000	0.0005	0.9997	1
6	5.9983	0.00	6.0000	0.00	9.0000	0.0005	0.9997	1
7	6.9981	0.00	7.0010	0.00	9.0000	0.0005	0.9996	1
8	7.9976	0.00	8.0010	0.00	9.0000	0.0005	0.9996	1
9	8.9971	0.00	9.0010	0.00	9.0000	0.0005	0.9996	1
10	9.9969	0.00	10.0000	0.00	9.0000	0.0005	0.9997	1

Details (all data) of electrometer current calibration: 'PTW-UNIDOS2-2.04'SN776 (exp117030)

no.irradiation	no.integration	nA.select	nA.ref	nA.meas
1	1	0.000000	−0.000000	0.000000
1	2	0.000000	−0.000000	0.000000
1	3	0.000000	−0.000000	0.000000
1	4	0.000000	−0.000000	0.000000
1	5	0.000000	−0.000000	0.000000
1	6	0.000000	−0.000000	0.000000
1	7	0.000000	−0.000000	0.000000
1	8	0.000000	−0.000000	0.000000
1	9	0.000000	−0.000000	0.000000
1	10	0.000000	−0.000000	0.000000
2	1	−1.000000	−0.999721	−1.000000
2	2	−1.000000	−0.999721	−1.000000
2	3	−1.000000	−0.999721	−1.000000
2	4	−1.000000	−0.999721	−1.000000
2	5	−1.000000	−0.999721	−1.000000
2	6	−1.000000	−0.999721	−1.000000
2	7	−1.000000	−0.999721	−1.000000
2	8	−1.000000	−0.999721	−1.000000
2	9	−1.000000	−0.999721	−1.000000
2	10	−1.000000	−0.999722	−1.000000
3	1	−2.000000	−1.999284	−2.000000
3	2	−2.000000	−1.999285	−2.000000
3	3	−2.000000	−1.999286	−2.000000
3	4	−2.000000	−1.999284	−2.000000
3	5	−2.000000	−1.999285	−2.000000
3	6	−2.000000	−1.999284	−2.000000
3	7	−2.000000	−1.999285	−2.000000
3	8	−2.000000	−1.999286	−2.000000
3	9	−2.000000	−1.999282	−2.000000
3	10	−2.000000	−1.999279	−2.000000
4	1	−3.000000	−2.999307	−3.001000
4	2	−3.000000	−2.999310	−3.001000
4	3	−3.000000	−2.999308	−3.001000
4	4	−3.000000	−2.999305	−3.001000
4	5	−3.000000	−2.999305	−3.001000
4	6	−3.000000	−2.999304	−3.001000
4	7	−3.000000	−2.999303	−3.001000
4	8	−3.000000	−2.999307	−3.001000

4	9	-3.000000	-2.999305	-3.001000
4	10	-3.000000	-2.999300	-3.001000
5	1	-4.000000	-3.999191	-4.001000
5	2	-4.000000	-3.999189	-4.001000
5	3	-4.000000	-3.999195	-4.001000
5	4	-4.000000	-3.999196	-4.001000
5	5	-4.000000	-3.999195	-4.001000
5	6	-4.000000	-3.999194	-4.001000
5	7	-4.000000	-3.999190	-4.001000
5	8	-4.000000	-3.999188	-4.001000
5	9	-4.000000	-3.999189	-4.001000
5	10	-4.000000	-3.999190	-4.001000
6	1	-5.000000	-4.998730	-5.001000
6	2	-5.000000	-4.998726	-5.001000
6	3	-5.000000	-4.998727	-5.001000
6	4	-5.000000	-4.998732	-5.001000
6	5	-5.000000	-4.998723	-5.001000
6	6	-5.000000	-4.998731	-5.001000
6	7	-5.000000	-4.998730	-5.001000
6	8	-5.000000	-4.998730	-5.001000
6	9	-5.000000	-4.998731	-5.001000
6	10	-5.000000	-4.998733	-5.001000
7	1	-6.000000	-5.998551	-6.001000
7	2	-6.000000	-5.998555	-6.001000
7	3	-6.000000	-5.998554	-6.001000
7	4	-6.000000	-5.998554	-6.001000
7	5	-6.000000	-5.998555	-6.001000
7	6	-6.000000	-5.998554	-6.001000
7	7	-6.000000	-5.998556	-6.001000
7	8	-6.000000	-5.998550	-6.001000
7	9	-6.000000	-5.998549	-6.001000
7	10	-6.000000	-5.998553	-6.001000
8	1	-7.000000	-6.998477	-7.001000
8	2	-7.000000	-6.998483	-7.001000
8	3	-7.000000	-6.998479	-7.001000
8	4	-7.000000	-6.998487	-7.001000
8	5	-7.000000	-6.998485	-7.001000
8	6	-7.000000	-6.998485	-7.001000
8	7	-7.000000	-6.998480	-7.001000
8	8	-7.000000	-6.998485	-7.001000

8	9	-7.000000	-6.998484	-7.001000
8	10	-7.000000	-6.998485	-7.001000
9	1	-8.000000	-7.997892	-8.001000
9	2	-8.000000	-7.997894	-8.001000
9	3	-8.000000	-7.997893	-8.001000
9	4	-8.000000	-7.997896	-8.001000
9	5	-8.000000	-7.997895	-8.001000
9	6	-8.000000	-7.997899	-8.001000
9	7	-8.000000	-7.997895	-8.001000
9	8	-8.000000	-7.997900	-8.001000
9	9	-8.000000	-7.997897	-8.001000
9	10	-8.000000	-7.997896	-8.001000
10	1	-9.000000	-8.997428	-9.001000
10	2	-9.000000	-8.997425	-9.001000
10	3	-9.000000	-8.997430	-9.001000
10	4	-9.000000	-8.997429	-9.001000
10	5	-9.000000	-8.997426	-9.001000
10	6	-9.000000	-8.997430	-9.001000
10	7	-9.000000	-8.997429	-9.001000
10	8	-9.000000	-8.997425	-9.001000
10	9	-9.000000	-8.997430	-9.001000
10	10	-9.000000	-8.997422	-9.001000
11	1	-10.000000	-9.997220	-10.000000
11	2	-10.000000	-9.997220	-10.000000
11	3	-10.000000	-9.997220	-10.000000
11	4	-10.000000	-9.997220	-10.000000
11	5	-10.000000	-9.997220	-10.000000
11	6	-10.000000	-9.997210	-10.000000
11	7	-10.000000	-9.997210	-10.000000
11	8	-10.000000	-9.997220	-10.000000
11	9	-10.000000	-9.997220	-10.000000
11	10	-10.000000	-9.997220	-10.000000
12	1	0.000000	-0.000000	-0.000050
12	2	0.000000	-0.000000	0.000000
12	3	0.000000	-0.000000	0.000000
12	4	0.000000	-0.000000	0.000000
12	5	0.000000	-0.000000	0.000000
12	6	0.000000	-0.000000	0.000000
12	7	0.000000	-0.000000	0.000000
12	8	0.000000	-0.000000	0.000000

12	9	0.000000	−0.000000	0.000000
12	10	0.000000	−0.000000	0.000000
13	1	1.000000	0.999685	1.000000
13	2	1.000000	0.999685	1.000000
13	3	1.000000	0.999685	0.999900
13	4	1.000000	0.999685	1.000000
13	5	1.000000	0.999685	0.999900
13	6	1.000000	0.999685	1.000000
13	7	1.000000	0.999685	0.999900
13	8	1.000000	0.999685	1.000000
13	9	1.000000	0.999685	1.000000
13	10	1.000000	0.999685	0.999900
14	1	2.000000	1.999093	1.999000
14	2	2.000000	1.999096	1.999000
14	3	2.000000	1.999094	1.999000
14	4	2.000000	1.999095	1.999000
14	5	2.000000	1.999091	1.999000
14	6	2.000000	1.999089	1.999000
14	7	2.000000	1.999092	1.999000
14	8	2.000000	1.999093	1.999000
14	9	2.000000	1.999094	1.999000
14	10	2.000000	1.999092	1.999000
15	1	3.000000	2.998989	3.000000
15	2	3.000000	2.998982	3.000000
15	3	3.000000	2.998983	3.000000
15	4	3.000000	2.998986	3.000000
15	5	3.000000	2.998984	3.000000
15	6	3.000000	2.998984	3.000000
15	7	3.000000	2.998985	3.000000
15	8	3.000000	2.998987	3.000000
15	9	3.000000	2.998983	3.000000
15	10	3.000000	2.998985	3.000000
16	1	4.000000	3.998753	4.000000
16	2	4.000000	3.998753	4.000000
16	3	4.000000	3.998753	4.000000
16	4	4.000000	3.998751	4.000000
16	5	4.000000	3.998749	4.000000
16	6	4.000000	3.998751	4.000000
16	7	4.000000	3.998751	4.000000
16	8	4.000000	3.998752	4.000000

16	9	4.000000	3.998751	4.000000
16	10	4.000000	3.998749	4.000000
17	1	5.000000	4.998520	5.000000
17	2	5.000000	4.998522	5.000000
17	3	5.000000	4.998523	5.000000
17	4	5.000000	4.998521	5.000000
17	5	5.000000	4.998526	5.000000
17	6	5.000000	4.998523	5.000000
17	7	5.000000	4.998522	5.000000
17	8	5.000000	4.998520	5.000000
17	9	5.000000	4.998521	5.000000
17	10	5.000000	4.998523	5.000000
18	1	6.000000	5.998256	6.000000
18	2	6.000000	5.998254	6.000000
18	3	6.000000	5.998256	6.000000
18	4	6.000000	5.998252	6.000000
18	5	6.000000	5.998257	6.000000
18	6	6.000000	5.998252	6.000000
18	7	6.000000	5.998254	6.000000
18	8	6.000000	5.998253	6.000000
18	9	6.000000	5.998252	6.000000
18	10	6.000000	5.998252	6.000000
19	1	7.000000	6.998106	7.001000
19	2	7.000000	6.998104	7.001000
19	3	7.000000	6.998102	7.001000
19	4	7.000000	6.998098	7.001000
19	5	7.000000	6.998099	7.001000
19	6	7.000000	6.998102	7.001000
19	7	7.000000	6.998103	7.001000
19	8	7.000000	6.998104	7.001000
19	9	7.000000	6.998096	7.001000
19	10	7.000000	6.998099	7.001000
20	1	8.000000	7.997626	8.001000
20	2	8.000000	7.997623	8.001000
20	3	8.000000	7.997621	8.001000
20	4	8.000000	7.997618	8.001000
20	5	8.000000	7.997618	8.001000
20	6	8.000000	7.997618	8.001000
20	7	8.000000	7.997623	8.001000
20	8	8.000000	7.997621	8.001000

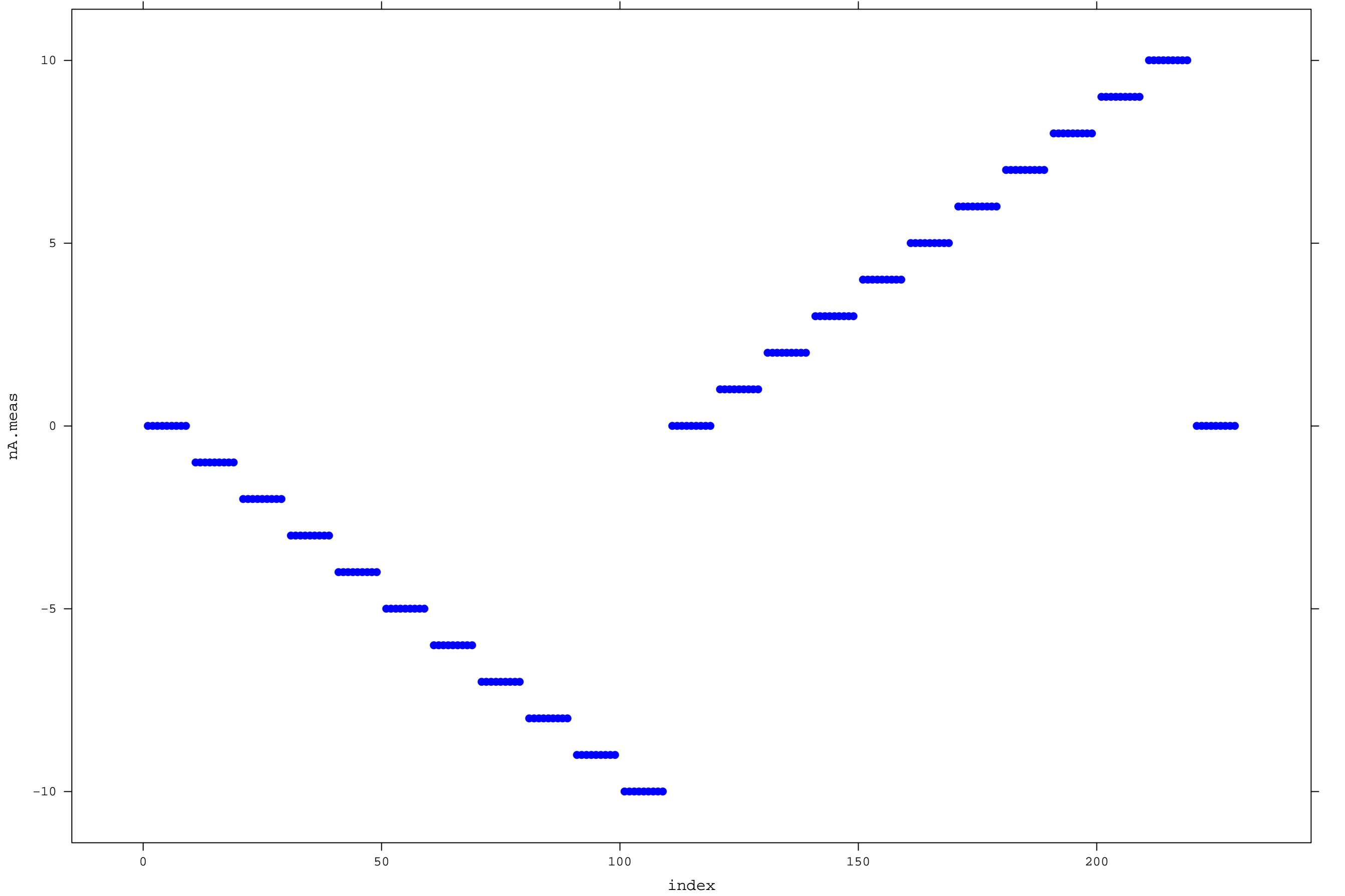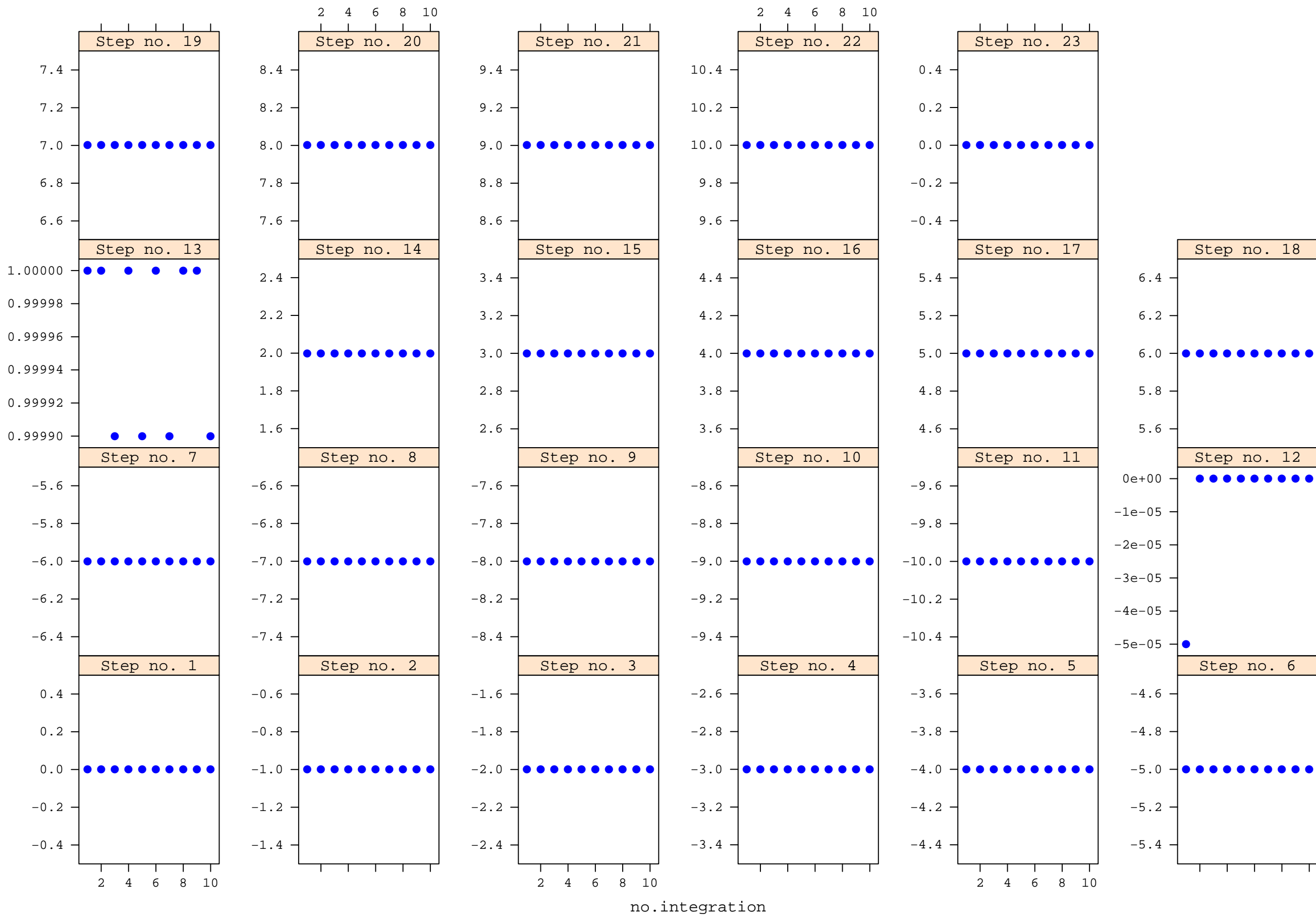| 20	9	8.000000	7.997618	8.001000
20	10	8.000000	7.997620	8.001000
21	1	9.000000	8.997093	9.001000
21	2	9.000000	8.997088	9.001000
21	3	9.000000	8.997100	9.001000
21	4	9.000000	8.997098	9.001000
21	5	9.000000	8.997094	9.001000
21	6	9.000000	8.997100	9.001000
21	7	9.000000	8.997096	9.001000
21	8	9.000000	8.997100	9.001000
21	9	9.000000	8.997100	9.001000
21	10	9.000000	8.997100	9.001000
22	1	10.000000	9.996847	10.000000
22	2	10.000000	9.996853	10.000000
22	3	10.000000	9.996851	10.000000
22	4	10.000000	9.996860	10.000000
22	5	10.000000	9.996853	10.000000
22	6	10.000000	9.996857	10.000000
22	7	10.000000	9.996857	10.000000
22	8	10.000000	9.996857	10.000000
22	9	10.000000	9.996853	10.000000
22	10	10.000000	9.996857	10.000000
23	1	0.000000	−0.000000	0.000000
23	2	0.000000	−0.000000	0.000000
23	3	0.000000	−0.000000	0.000000
23	4	0.000000	−0.000000	0.000000
23	5	0.000000	−0.000000	0.000000
23	6	0.000000	−0.000000	0.000000
23	7	0.000000	−0.000000	0.000000
23	8	0.000000	−0.000000	0.000000
23	9	0.000000	−0.000000	0.000000
23	10	0.000000	−0.000000	0.000000

exp117030 (all data)
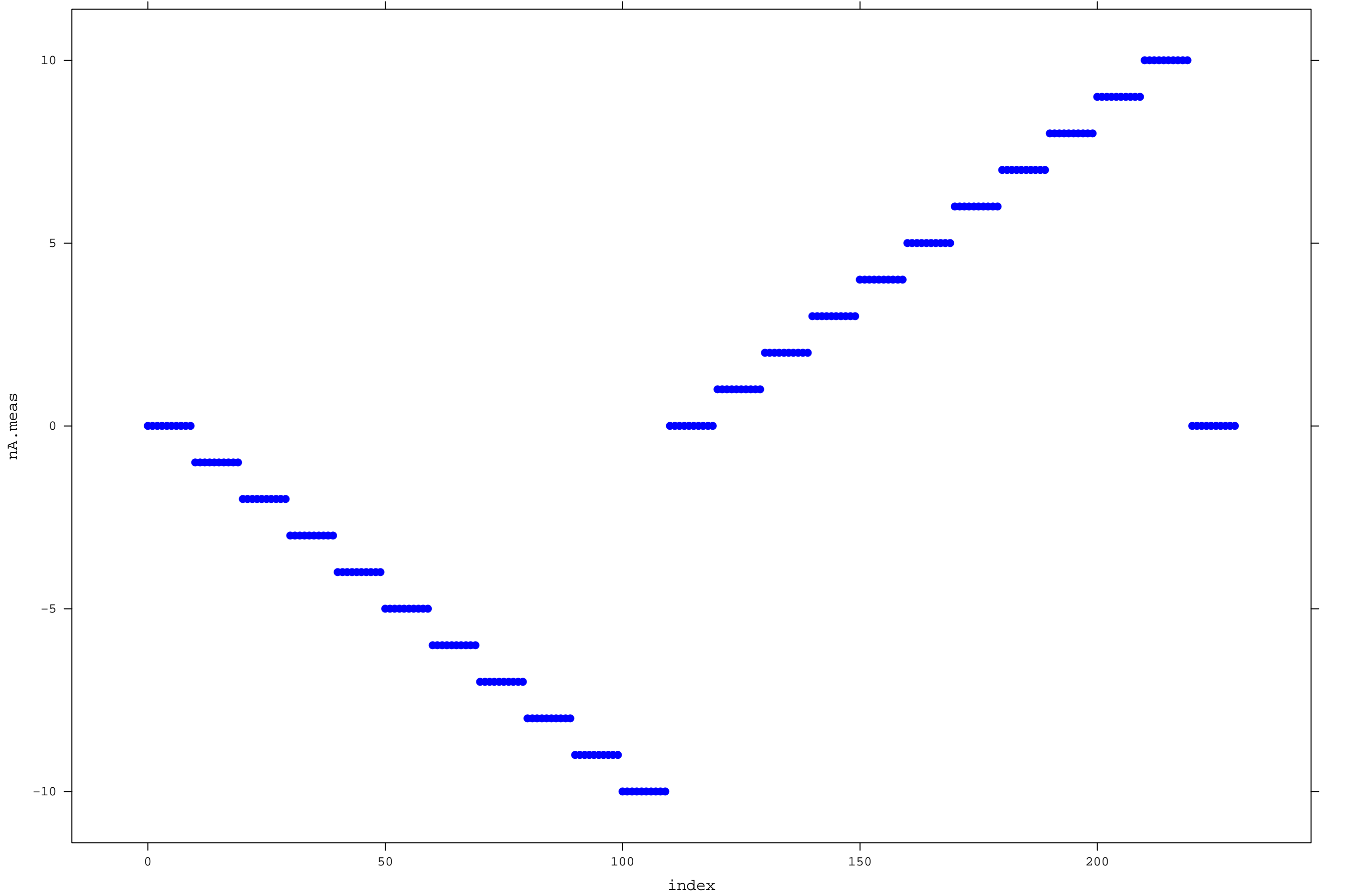
exp117030 (all data) Note that a trend in these data (especially for currents < 200 pA) could indicate that the measurements were not stable (averaging over the transient). See CAs Electrometer logbook no. 7 (April 16, 2019).
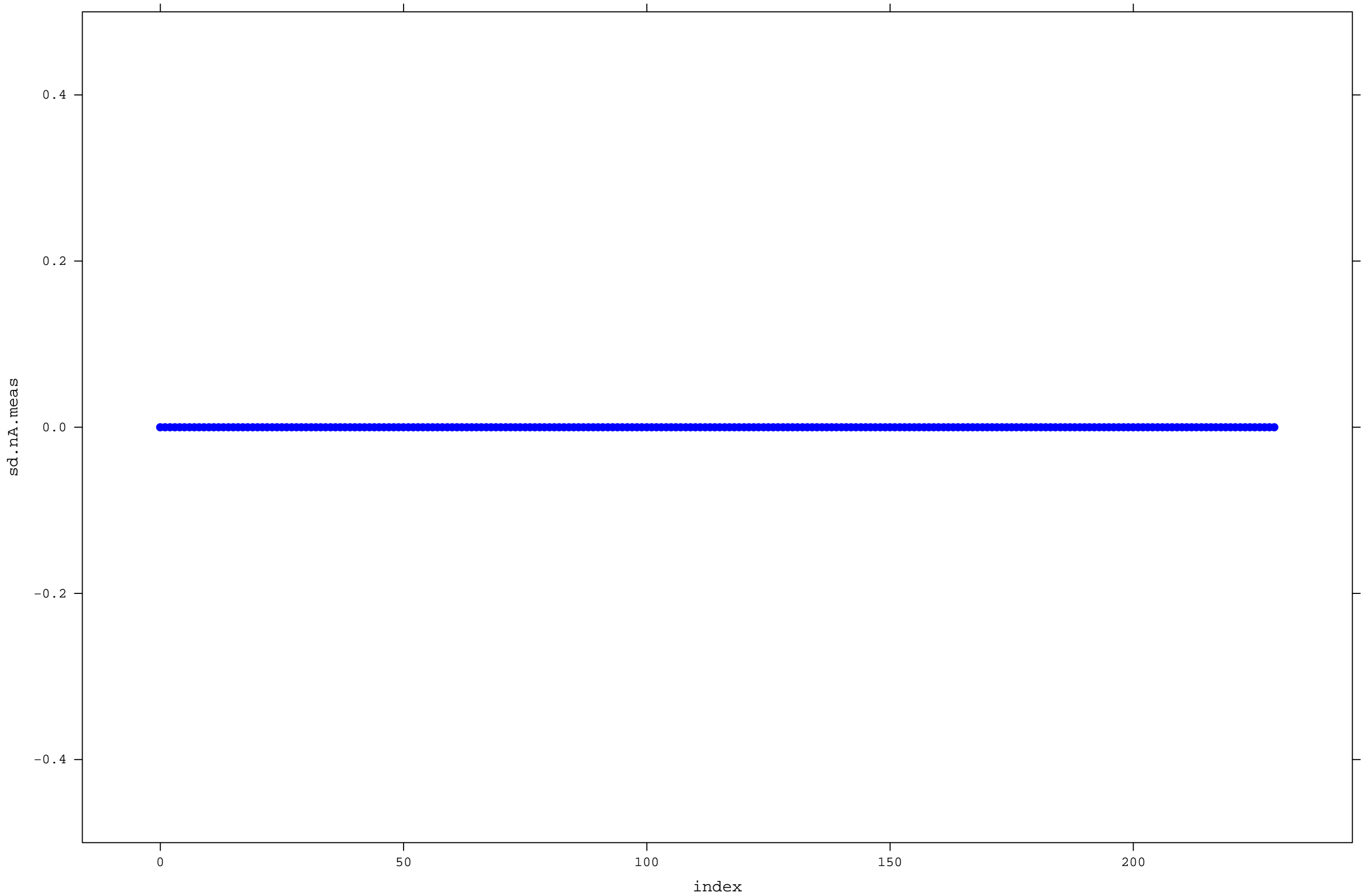
exp117030 (censored data; used in analysis)

exp117030

exp117030

Step no. 19	Step no. 20	Step no. 21	Step no. 22	Step no. 23
Mean = 7.00100 nA SD= 0.000 % N = 10	Mean = 8.00100 nA SD= 0.000 % N = 10	Mean = 9.00100 nA SD= 0.000 % N = 10	Mean = 10.00000 n SD= 0.000 % N = 10	Mean = 0.00000 nA SD= NaN % N = 10

Step no. 13	Step no. 14	Step no. 15	Step no. 16	Step no. 17	Step no. 18
Mean = 0.99996 nA SD= 0.005 % N = 10	Mean = 1.99900 nA SD= 0.000 % N = 10	Mean = 3.00000 nA SD= 0.000 % N = 10	Mean = 4.00000 nA SD= 0.000 % N = 10	Mean = 5.00000 nA SD= 0.000 % N = 10	Mean = 6.00000 nA SD= 0.000 % N = 10

Step no. 7	Step no. 8	Step no. 9	Step no. 10	Step no. 11	Step no. 12
Mean = −6.00100 n SD= 0.000 % N = 10	Mean = −7.00100 n SD= 0.000 % N = 10	Mean = −8.00100 n SD= 0.000 % N = 10	Mean = −9.00100 n SD= 0.000 % N = 10	Mean = −10.00000 SD= 0.000 % N = 10	Mean = −0.00000 n SD= −316.228 % N = 10

Step no. 1	Step no. 2	Step no. 3	Step no. 4	Step no. 5	Step no. 6
Mean = 0.00000 nA SD= NaN % N = 10	Mean = −1.00000 n SD= 0.000 % N = 10	Mean = −2.00000 n SD= 0.000 % N = 10	Mean = −3.00100 n SD= 0.000 % N = 10	Mean = −4.00100 n SD= 0.000 % N = 10	Mean = −5.00100 n SD= 0.000 % N = 10

nA.meas

no.integration