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SENSOR SERIAL NUMBER: 1137
CALIBRATION DATE: 12-Oct-23

SBE 9plus PRESSURE CALIBRATION DATA
10000 psia S/N 1137

DIGIQUARTZ COEFFICIENTS:

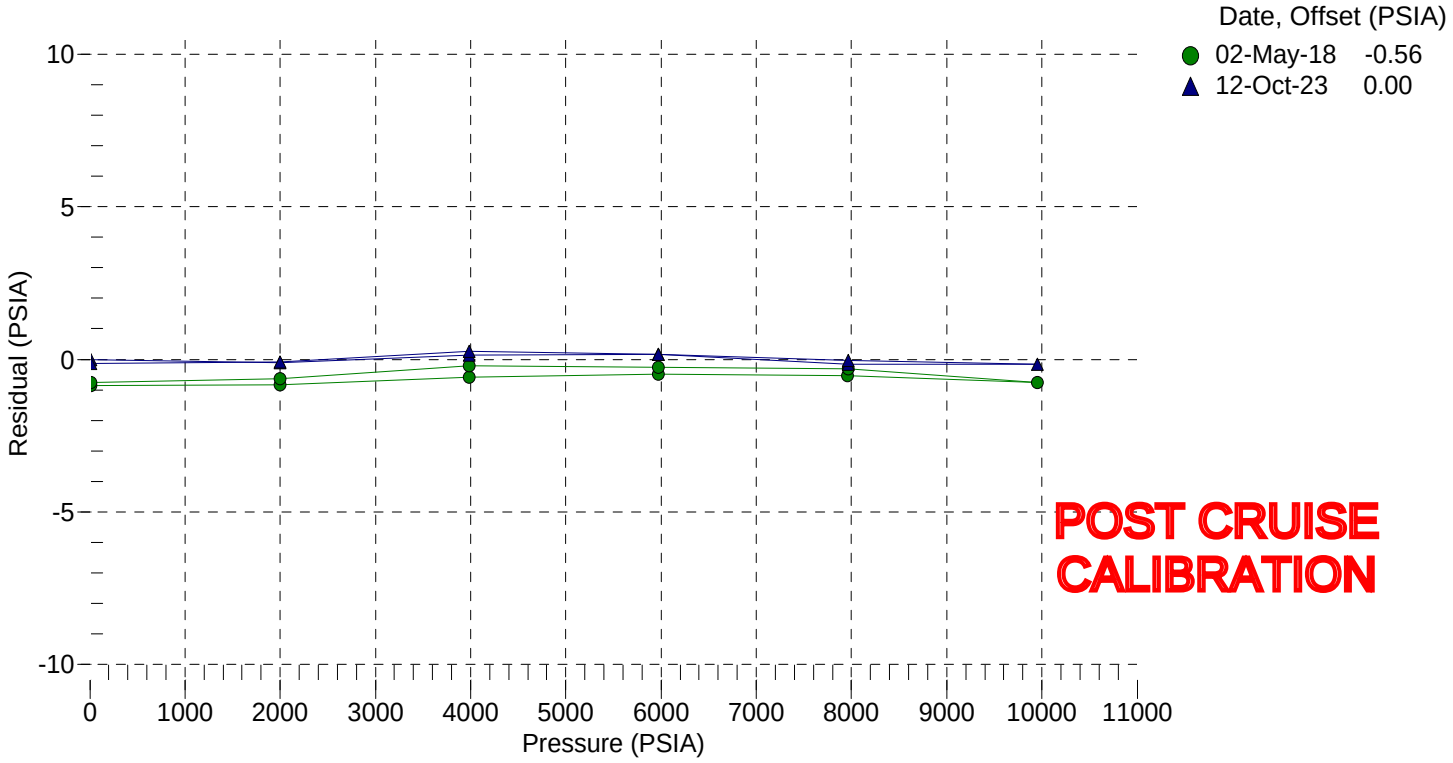
```
C1 =  -4.003692e+004
C2 =   4.506477e-001
C3 =   1.326100e-002
D1 =   3.514900e-002
D2 =   0.000000e+000
T1 =   3.019043e+001
T2 =  -7.917310e-005
T3 =   4.270180e-006
T4 =   2.945840e-009
T5 =   0.000000e+000
```

AD590M, AD590B, SLOPE AND OFFSET:

```
AD590M =   1.28040e-002
AD590B =  -8.79038e+000
Slope  =   1.00003
Offset =  -0.4588 (dbars)
```

PRESSURE (PSIA)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT TEMPERATURE (°C)	INSTRUMENT PRESSURE (PSIA)	CORRECTED PRESSURE (PSIA)	RESIDUAL (PSIA)
14.517	33129.00	21.7	15.161	14.495	-0.022
2000.621	33939.30	21.8	2001.115	2000.500	-0.121
3987.634	34728.50	21.8	3988.345	3987.780	0.146
5974.812	35497.50	21.8	5975.478	5974.964	0.152
7962.176	36247.60	21.9	7962.476	7962.013	-0.163
9949.972	36980.30	21.9	9950.233	9949.819	-0.153
7962.598	36247.80	21.9	7963.018	7962.554	-0.044
5975.330	35497.70	21.9	5976.016	5975.502	0.172
3988.299	34728.80	21.9	3989.138	3988.573	0.274
2000.646	33939.30	21.9	2001.163	2000.548	-0.098
14.512	33128.90	22.1	15.034	14.369	-0.143

Residual (PSIA) = corrected instrument pressure - reference pressure



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SENSOR SERIAL NUMBER: 5571
CALIBRATION DATE: 24-Oct-23

SBE 3 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

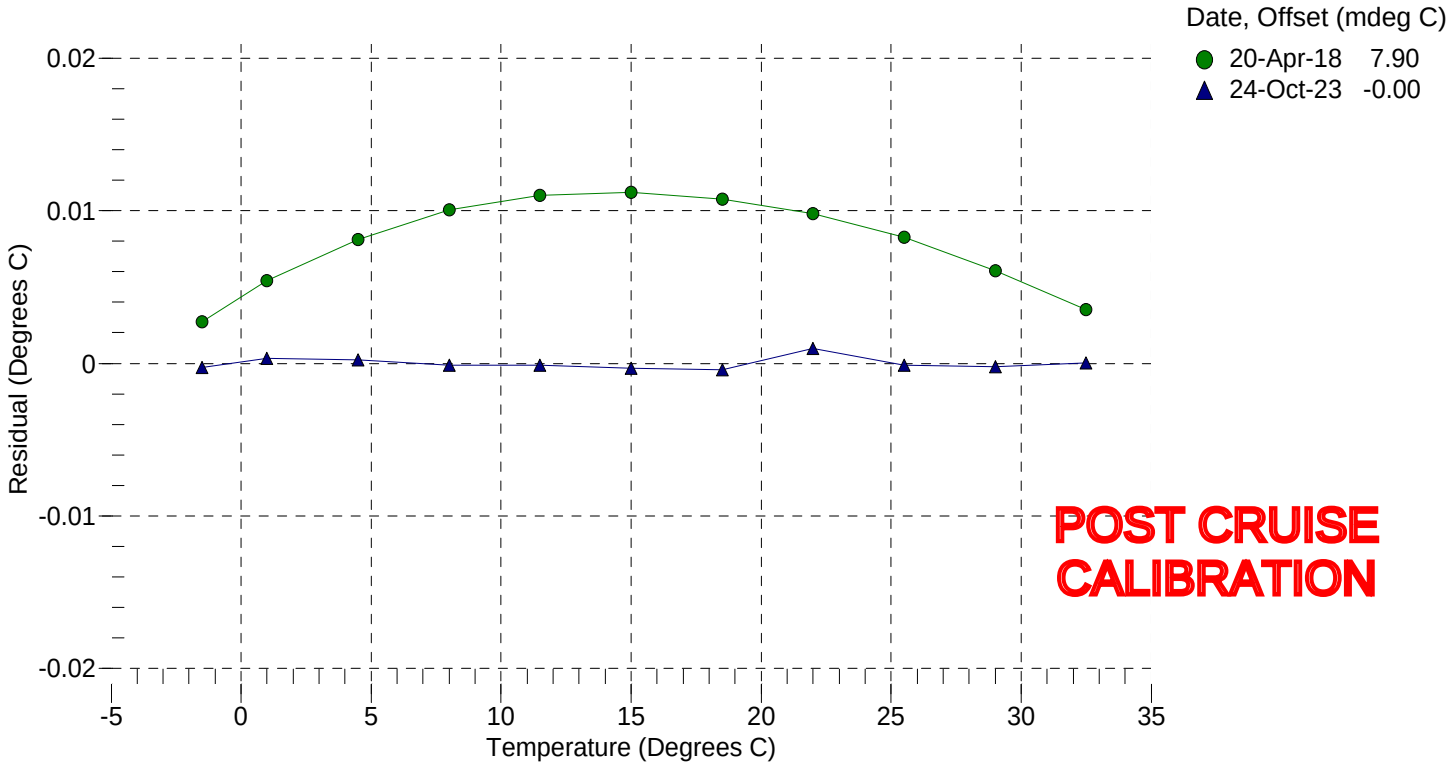
```
g =  4.33700181e-003
h =  6.30250804e-004
i =  2.21079188e-005
j =  1.91427101e-006
f0 =  1000.0
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
-1.5000	2937.167	-1.5003	-0.00029
1.0000	3109.662	1.0003	0.00034
4.5000	3363.367	4.5002	0.00025
8.0001	3631.780	8.0000	-0.00010
11.5000	3915.353	11.4999	-0.00012
15.0000	4214.493	14.9997	-0.00031
18.5000	4529.624	18.4996	-0.00041
22.0000	4861.286	22.0010	0.00099
25.5000	5209.480	25.4999	-0.00013
29.0001	5574.938	28.9999	-0.00021
32.5001	5957.936	32.5001	0.00001

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1/\{g + h[ln(f0 / f)] + i[ln^2(f0 / f)] + j[ln^3(f0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 5571
CALIBRATION DATE: 20-Dec-23

SBE 3 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

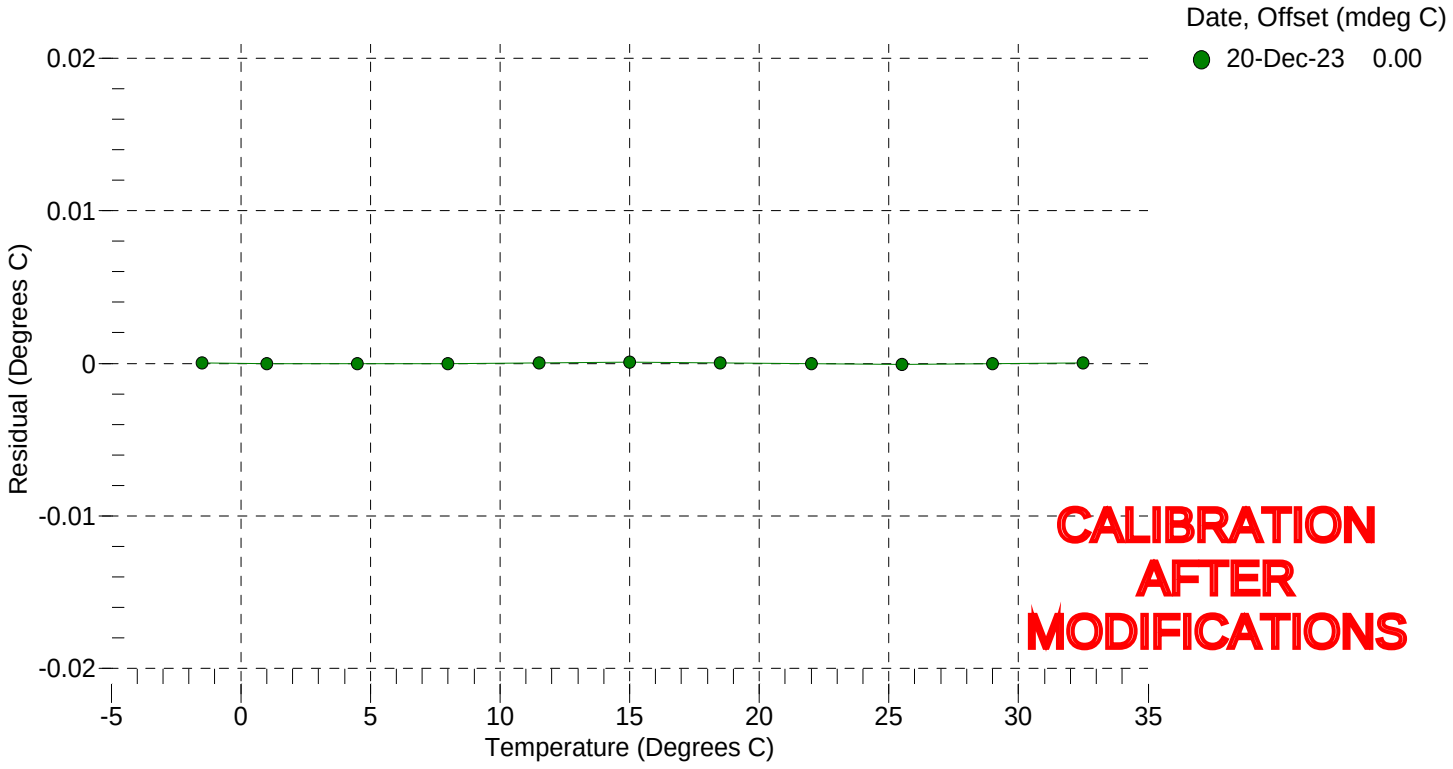
```
g =  4.36428259e-003
h =  6.40163727e-004
i =  2.22597171e-005
j =  2.07174119e-006
f0 =  1000.0
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
-1.5000	3019.624	-1.5000	0.00004
1.0000	3194.067	1.0000	-0.00003
4.5000	3450.379	4.5000	-0.00005
8.0000	3721.156	8.0000	-0.00001
11.5000	4006.786	11.5000	0.00002
15.0000	4307.650	15.0001	0.00007
18.5000	4624.106	18.5000	0.00002
22.0000	4956.521	22.0000	-0.00001
25.5001	5305.243	25.5000	-0.00008
29.0000	5670.591	29.0000	-0.00001
32.5000	6052.895	32.5000	0.00004

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1/\{g + h[ln(f0 / f)] + i[ln^2(f0 / f)] + j[ln^3(f0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 5693
CALIBRATION DATE: 31-Oct-23

SBE 3 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

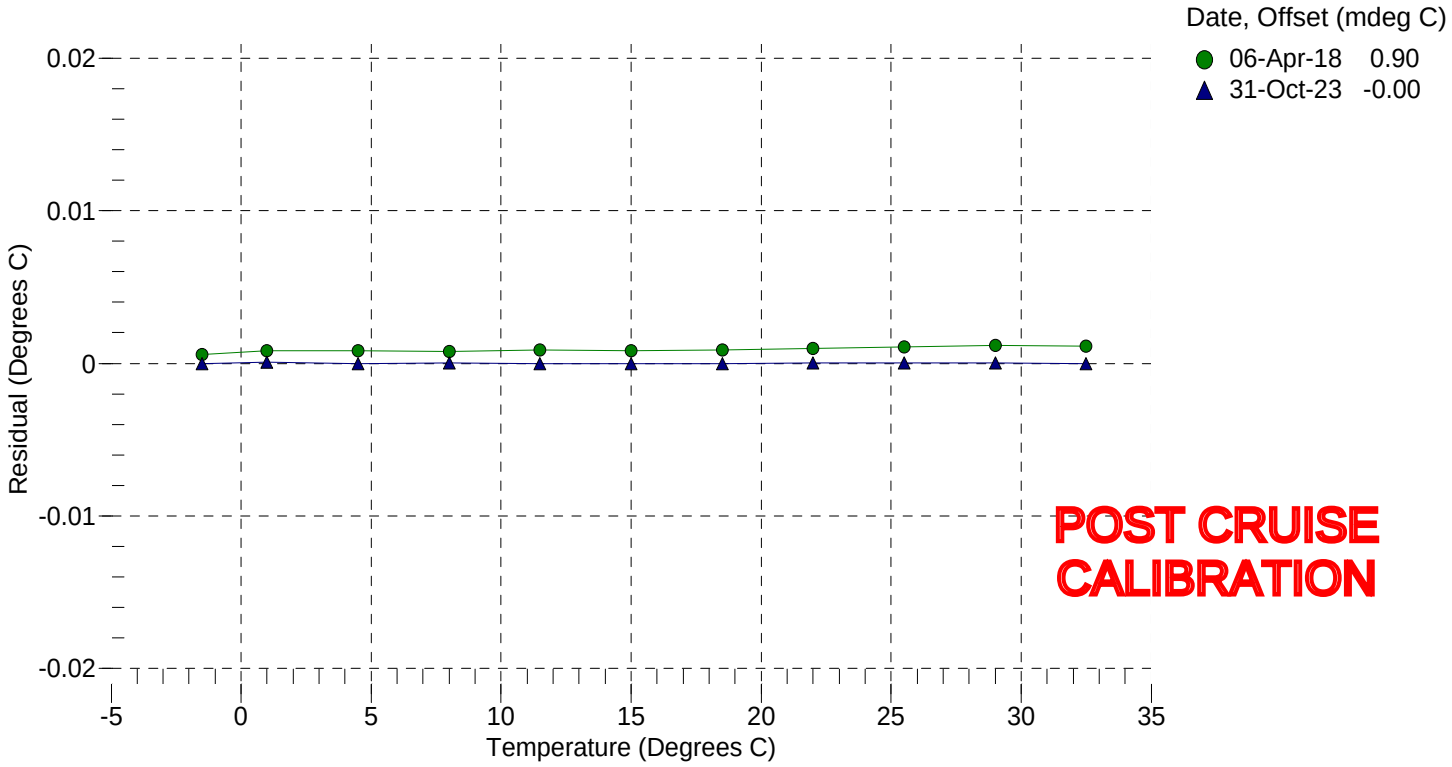
```
g =  4.37665247e-003
h =  6.30350753e-004
i =  1.95415360e-005
j =  1.37038489e-006
f0 =  1000.0
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
-1.5000	3127.882	-1.5000	-0.00004
1.0000	3310.926	1.0001	0.00007
4.5001	3580.081	4.5001	-0.00003
8.0000	3864.698	8.0000	0.00003
11.5000	4165.226	11.5000	-0.00003
15.0000	4482.113	15.0000	-0.00001
18.5000	4815.775	18.5000	-0.00005
22.0000	5166.648	22.0000	0.00002
25.5000	5535.124	25.5000	0.00003
29.0000	5921.603	29.0000	0.00003
32.5000	6326.466	32.5000	-0.00003

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1/\{g + h[ln(f0 / f)] + i[ln^2(f0 / f)] + j[ln^3(f0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 5693
CALIBRATION DATE: 15-Nov-23

SBE 3 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

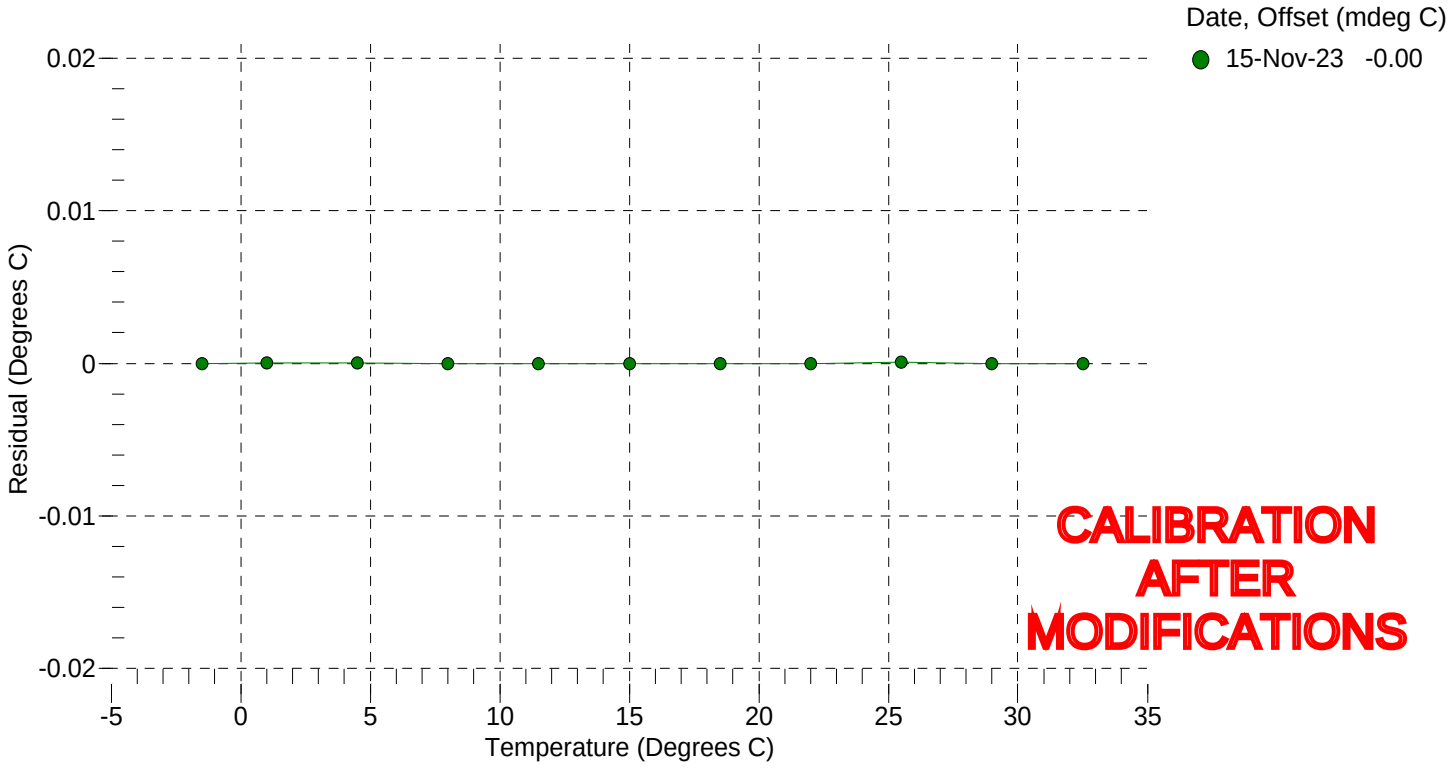
```
g =  4.37673654e-003
h =  6.30508732e-004
i =  1.96384352e-005
j =  1.39084697e-006
f0 =  1000.0
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
-1.5000	3127.880	-1.5000	-0.00004
1.0000	3310.917	1.0000	0.00004
4.5000	3580.064	4.5000	0.00003
8.0000	3864.675	8.0000	-0.00001
11.5000	4165.200	11.5000	-0.00004
15.0000	4482.083	15.0000	-0.00000
18.5000	4815.742	18.5000	-0.00002
22.0000	5166.603	22.0000	-0.00001
25.5001	5535.090	25.5002	0.00007
29.0000	5921.543	29.0000	-0.00000
32.5000	6326.400	32.5000	-0.00002

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1/\{g + h[ln(f0 / f)] + i[ln^2(f0 / f)] + j[ln^3(f0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 1194
CALIBRATION DATE: 29-Nov-23

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -3.99535240e+000
h =   5.20513374e-001
i =   1.86562816e-005
j =   2.60160791e-005

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

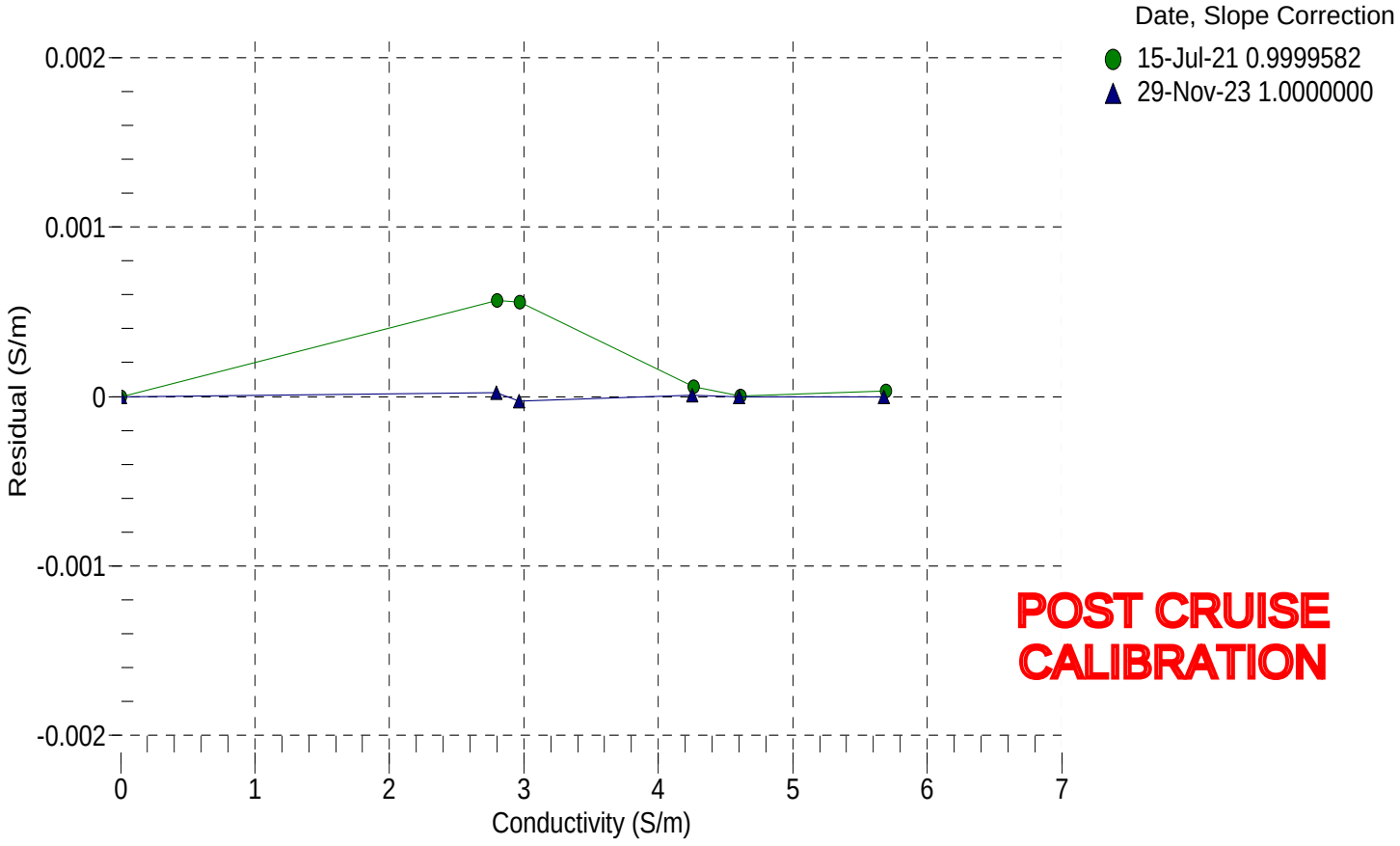
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.76985	0.00000	0.00000
-1.0000	34.6538	2.79270	7.81825	2.79273	0.00002
1.0000	34.6547	2.96346	8.02392	2.96344	-0.00003
15.0000	34.6529	4.25368	9.43266	4.25369	0.00001
18.4999	34.6513	4.59883	9.77461	4.59882	-0.00000
28.9999	34.6443	5.67730	10.77216	5.67730	-0.00000
32.4999	34.6305	6.04723	11.09397	6.04806	0.00083

f = Instrument Output (kHz)

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 1194
CALIBRATION DATE: 14-Dec-23

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -3.98847762e+000
h =   5.19688130e-001
i =   1.37208180e-004
j =   2.11691908e-005

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

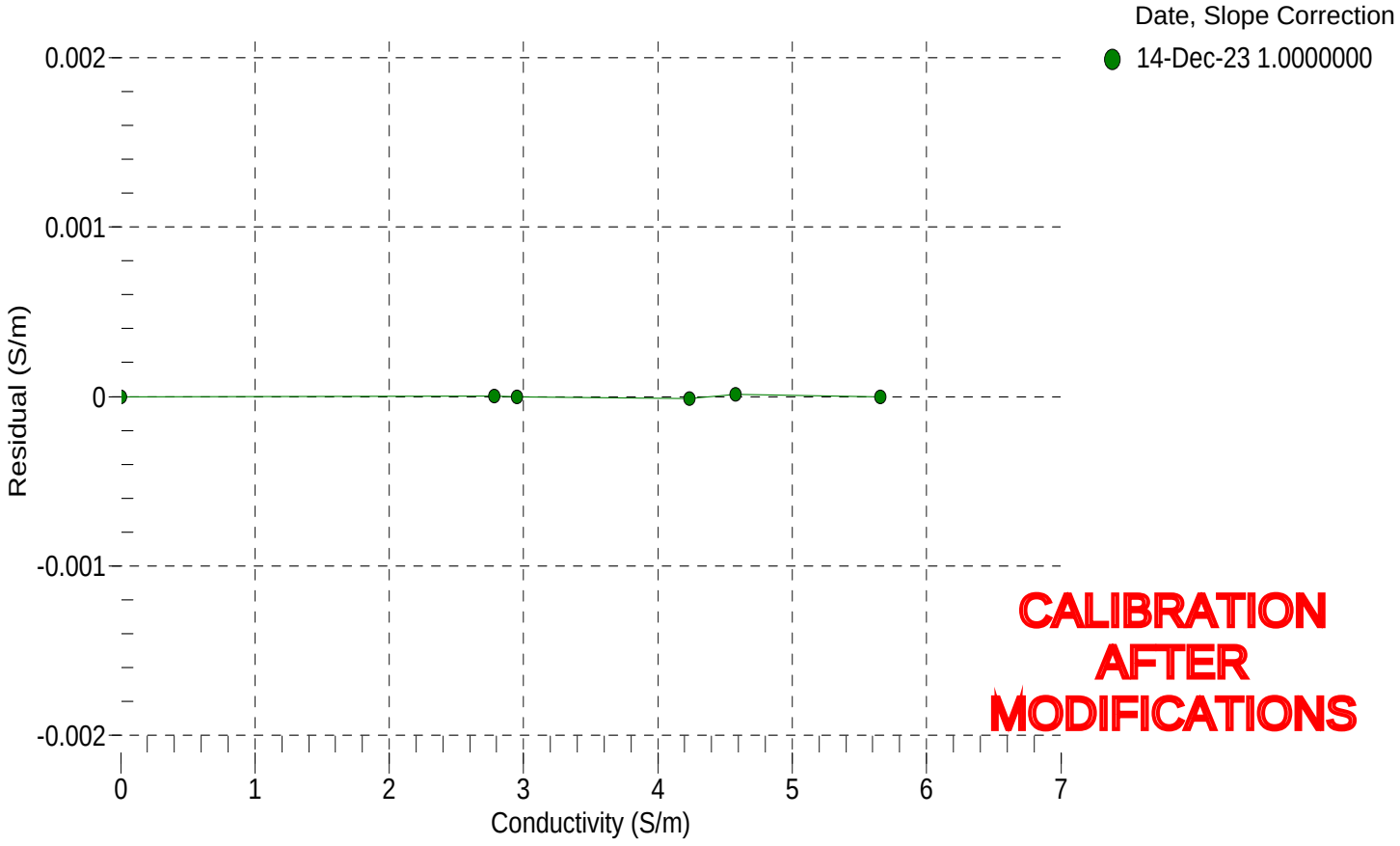
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.76889	0.00000	0.00000
-1.0000	34.4948	2.78108	7.80464	2.78108	0.00000
1.0000	34.4944	2.95106	8.00979	2.95106	-0.00000
15.0000	34.4913	4.23594	9.41527	4.23593	-0.00001
18.4999	34.4886	4.57955	9.75639	4.57956	0.00001
29.0001	34.4790	5.65327	10.75149	5.65326	-0.00000
32.5000	34.4594	6.02075	11.07307	6.02301	0.00226

f = Instrument Output (kHz)

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 4207
CALIBRATION DATE: 27-Oct-23

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -9.75670938e+000
h =   1.24274258e+000
i =  -2.16688964e-003
j =   2.12272507e-004

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

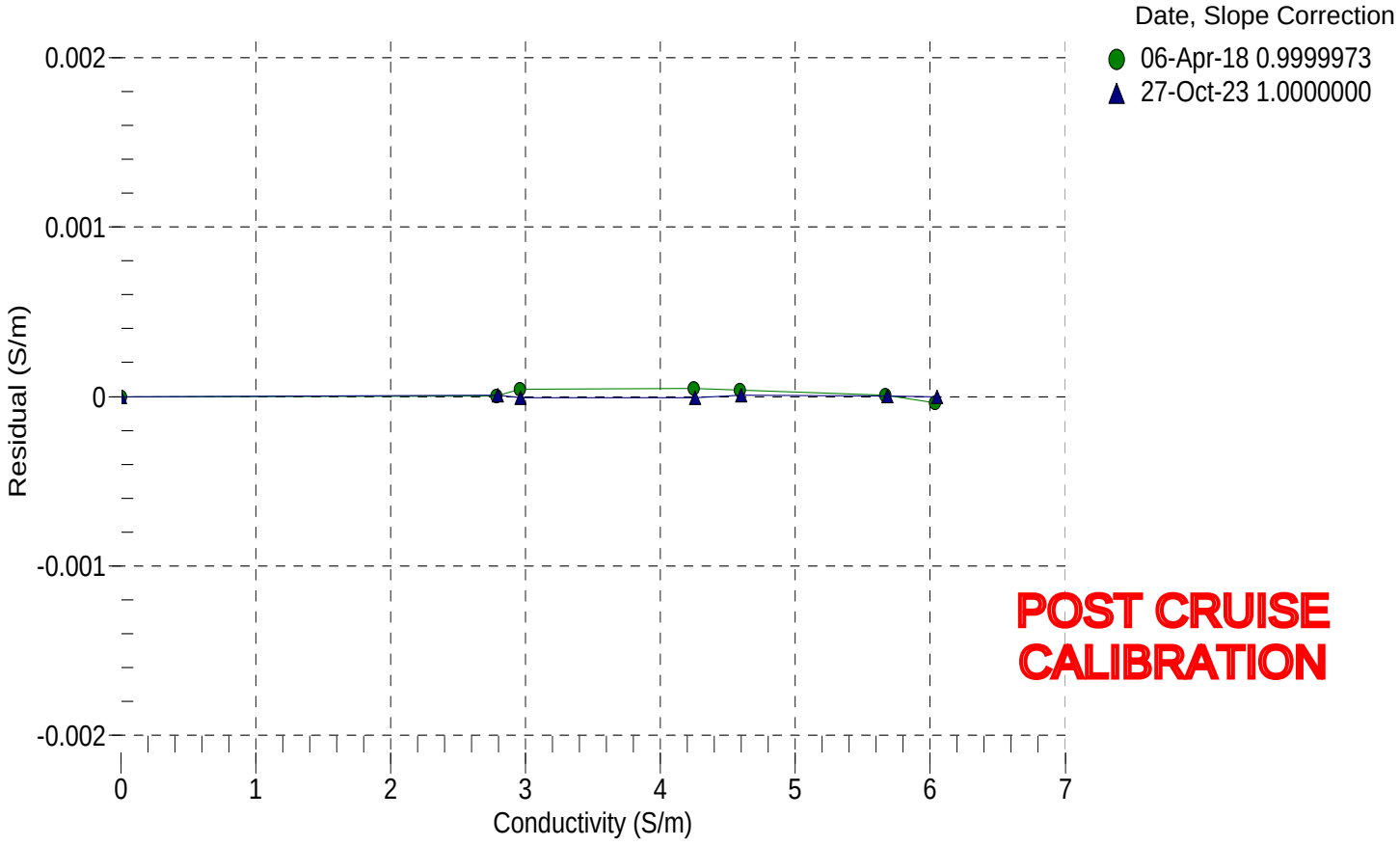
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.80694	0.00000	0.00000
-1.0000	34.6695	2.79385	5.51969	2.79386	0.00001
1.0000	34.6702	2.96466	5.64331	2.96466	-0.00001
15.0000	34.6704	4.25561	6.50156	4.25560	-0.00001
18.5000	34.6695	4.60099	6.71243	4.60100	0.00001
29.0000	34.6636	5.68012	7.33180	5.68012	0.00000
32.4999	34.6496	6.05019	7.53230	6.05019	-0.00000

f = Instrument Output (kHz)

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 4207
CALIBRATION DATE: 14-Nov-23

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -9.75696894e+000
h =   1.24292590e+000
i =  -2.24657971e-003
j =   2.20065157e-004

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

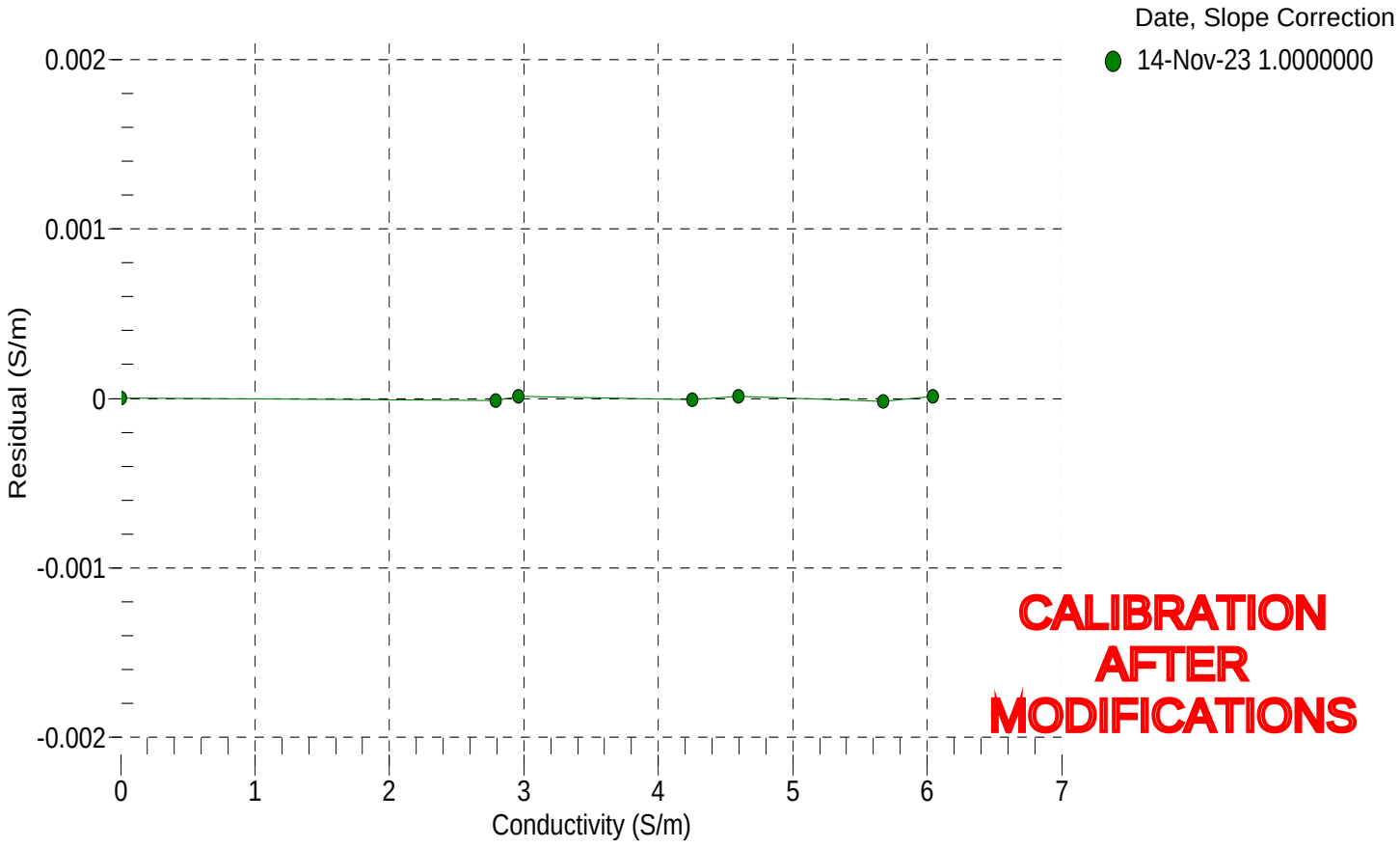
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.80695	0.00000	0.00000
-1.0000	34.6168	2.79000	5.51692	2.78999	-0.00001
1.0000	34.6167	2.96052	5.64042	2.96054	0.00001
15.0000	34.6169	4.24973	6.49794	4.24973	-0.00001
18.5000	34.6155	4.59460	6.70861	4.59461	0.00001
29.0000	34.6111	5.67248	7.32755	5.67246	-0.00002
32.5001	34.6007	6.04264	7.52821	6.04265	0.00001

f = Instrument Output (kHz)

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 4209
CALIBRATION DATE: 31-Oct-23

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -9.87829660e+000
h =   1.45650725e+000
i =  -2.74339687e-003
j =   3.15172772e-004

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

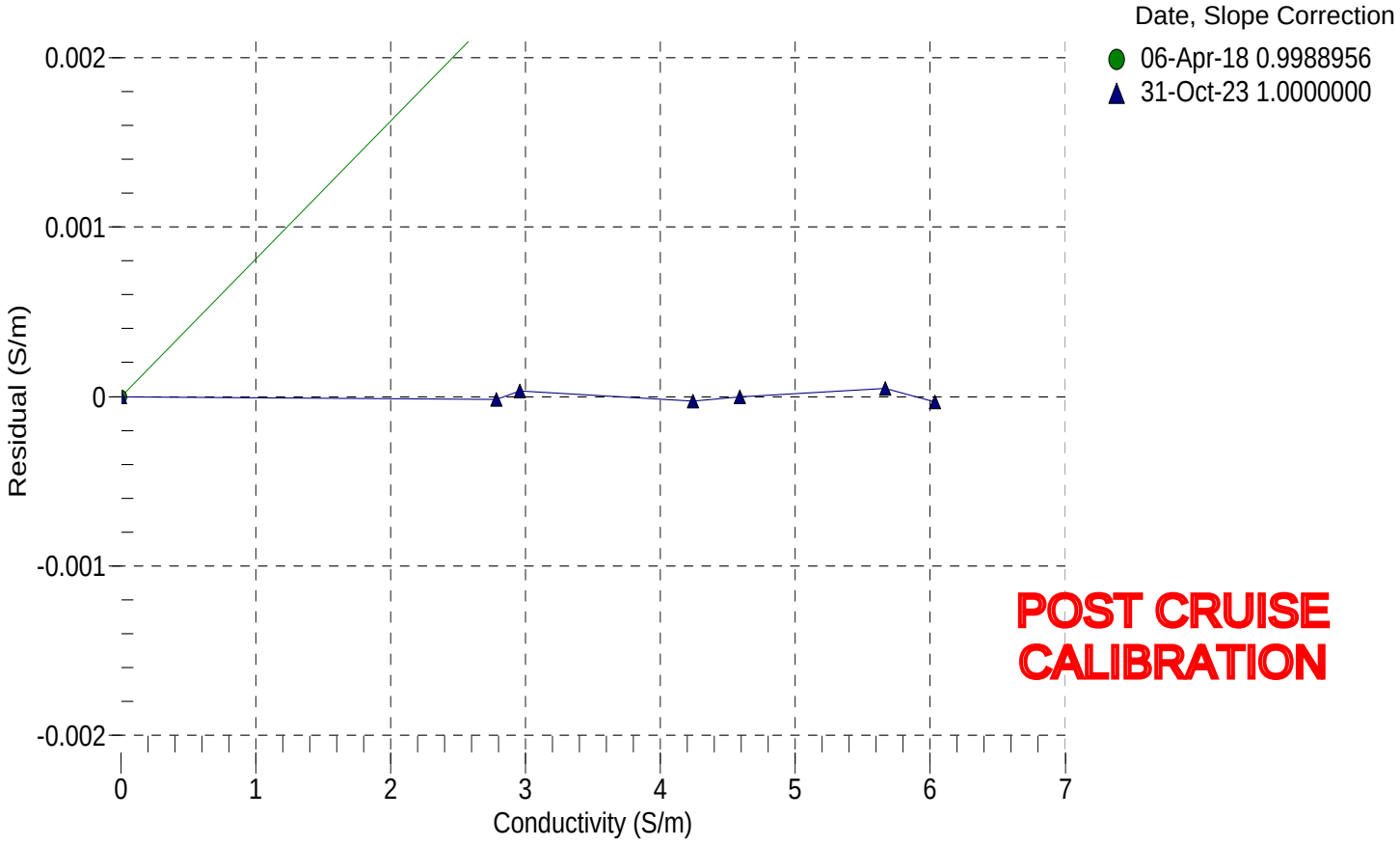
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.60875	0.00000	0.00000
-1.0000	34.5606	2.78589	5.10026	2.78587	-0.00002
1.0000	34.5600	2.95614	5.21398	2.95617	0.00003
15.0000	34.5601	4.24350	6.00372	4.24347	-0.00003
18.5000	34.5593	4.58794	6.19781	4.58794	-0.00000
29.0000	34.5541	5.66419	6.76793	5.66423	0.00005
32.5000	34.5407	6.03334	6.95249	6.03331	-0.00003

f = Instrument Output (kHz)

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 4209
CALIBRATION DATE: 29-Nov-23

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -9.86202064e+000
h =   1.45413666e+000
i =  -2.49149301e-003
j =   2.89546917e-004

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

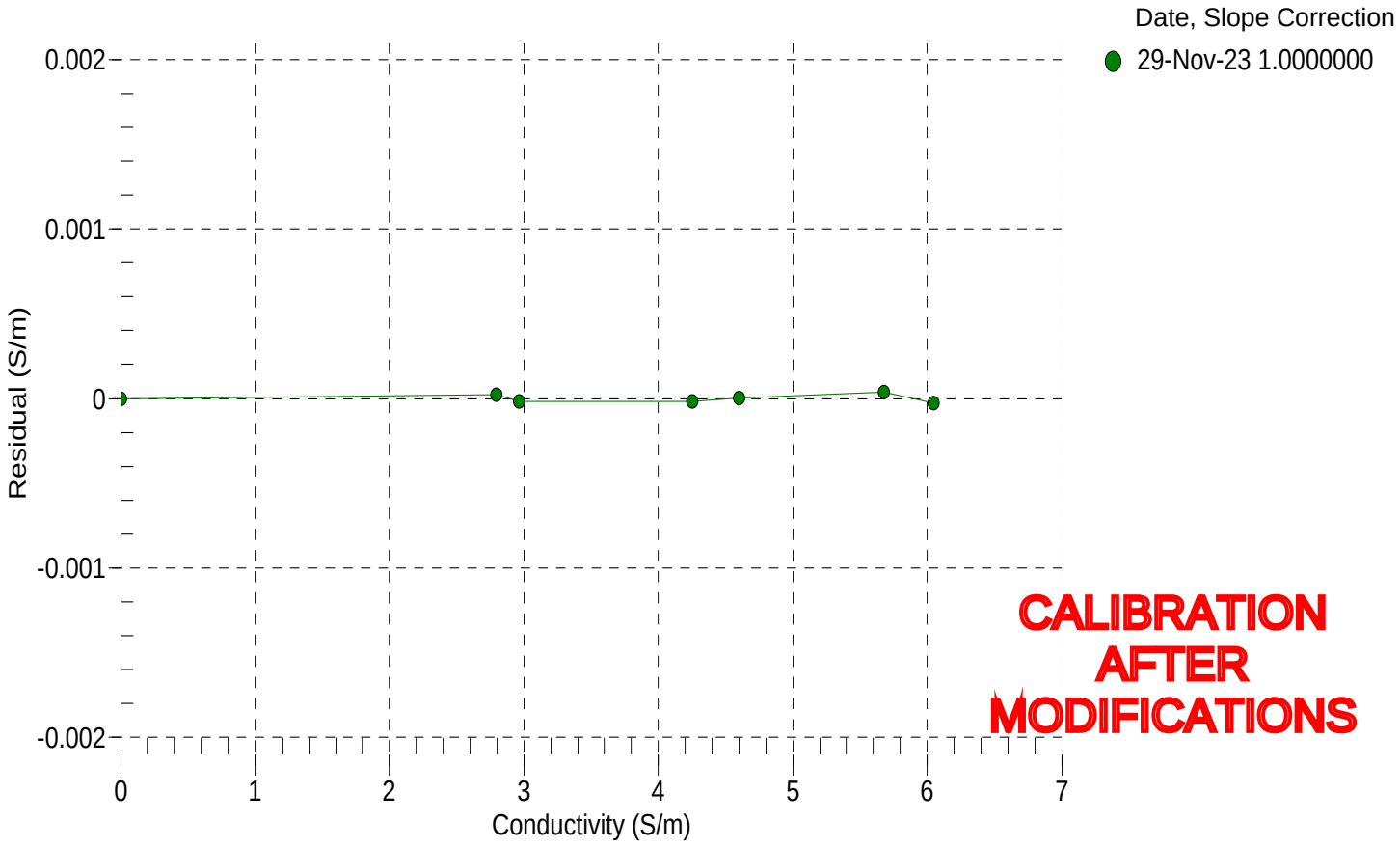
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.60830	0.00000	0.00000
-1.0000	34.6538	2.79270	5.10687	2.79273	0.00002
1.0000	34.6547	2.96346	5.22086	2.96345	-0.00002
15.0000	34.6529	4.25368	6.01231	4.25367	-0.00002
18.4999	34.6513	4.59883	6.20677	4.59883	0.00000
28.9999	34.6443	5.67730	6.77803	5.67734	0.00004
32.4999	34.6305	6.04723	6.96298	6.04721	-0.00003

f = Instrument Output (kHz)

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 2526
CALIBRATION DATE: 09-Dec-23

SBE 43 OXYGEN CALIBRATION DATA

COEFFICIENTS:
Soc = 0.4552
Voffset = -0.4828
Tau20 = 1.01
A = -4.5611e-003
B = 1.6584e-004
C = -2.1187e-006
E nominal = 0.036

NOMINAL DYNAMIC COEFFICIENTS
D1 = 1.92634e-4
D2 = -4.64803e-2
H1 = -3.300000e-2
H2 = 5.00000e+3
H3 = 1.45000e+3

BATH OXYGEN (ml/l)	BATH TEMPERATURE (° C)	BATH SALINITY (PSU)	INSTRUMENT OUTPUT (volts)	INSTRUMENT OXYGEN (ml/l)	RESIDUAL (ml/l)
1.21	12.00	0.00	0.847	1.21	0.00
1.21	26.00	0.00	0.973	1.21	0.00
1.21	20.00	0.00	0.919	1.21	0.00
1.21	30.00	0.00	1.012	1.22	0.00
1.22	6.00	0.00	0.797	1.22	-0.00
1.23	2.00	0.00	0.764	1.23	-0.00
3.99	12.00	0.00	1.686	3.99	-0.00
3.99	20.00	0.00	1.919	3.99	-0.00
3.99	6.00	0.00	1.512	3.99	0.00
3.99	26.00	0.00	2.100	4.00	0.00
3.99	30.00	0.00	2.220	4.00	0.00
4.00	2.00	0.00	1.397	3.99	-0.00
6.79	2.00	0.00	2.037	6.79	-0.00
6.82	6.00	0.00	2.242	6.82	0.00
6.85	12.00	0.00	2.549	6.85	0.00
6.89	30.00	0.00	3.476	6.88	-0.00
6.90	20.00	0.00	2.970	6.90	-0.00
6.94	26.00	0.00	3.291	6.94	0.00

V = instrument output (volts); T = temperature (°C); S = salinity (PSU); K = temperature (°K)
Oxsol(T,S) = oxygen saturation (ml/l); P = pressure (dbar)
Oxygen (ml/l) = Soc * (V + Voffset) * (1.0 + A * T + B * T^2 + C * T^3) * Oxsol(T,S) * exp(E * P / K)
Residual (ml/l) = instrument oxygen - bath oxygen