



Sea-Bird GmbH
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www.seabird.com

SENSOR SERIAL NUMBER: 3257
CALIBRATION DATE: 31-Aug-17

SBE 21 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

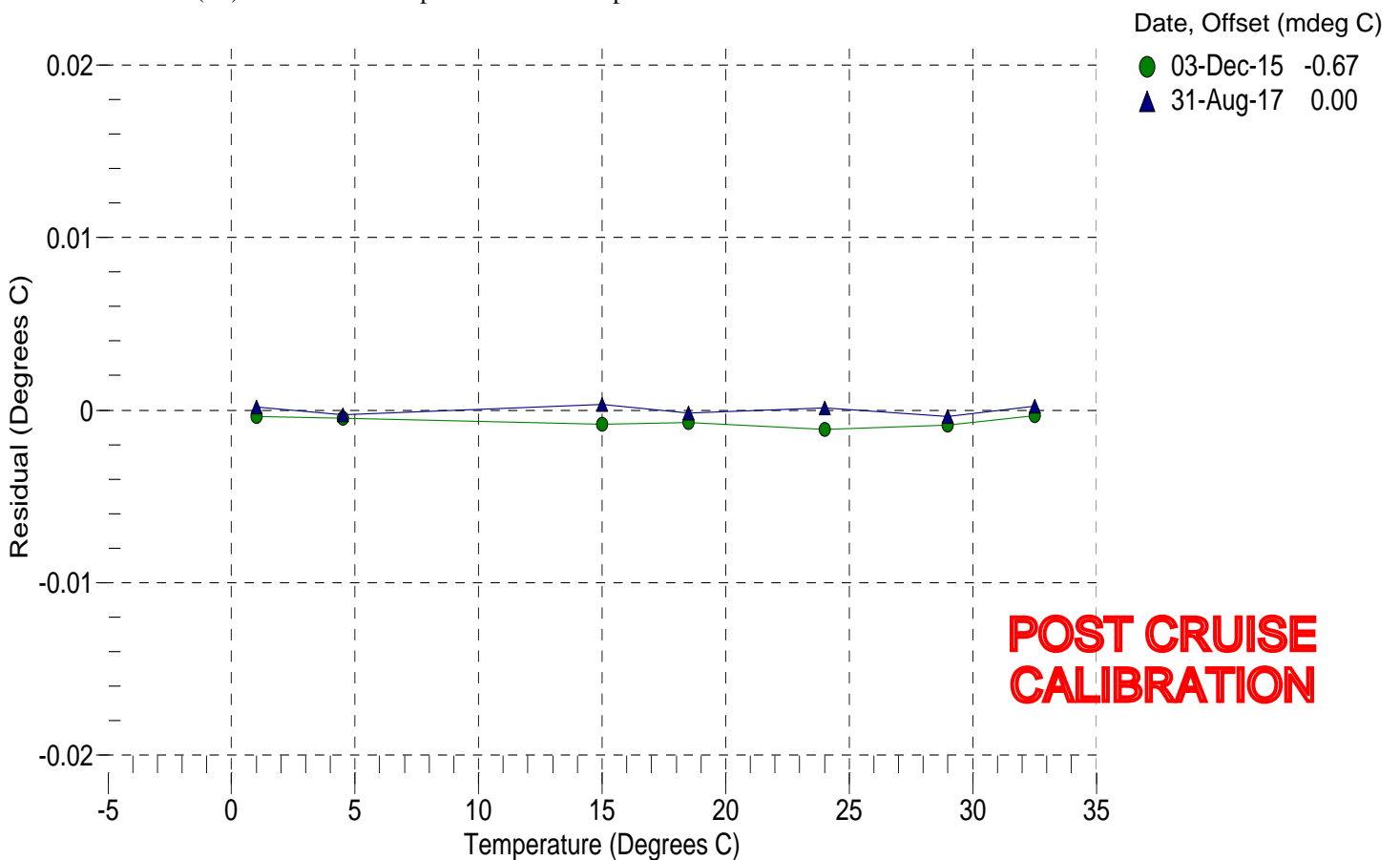
$g = 4.16030636e-003$
 $h = 6.28249834e-004$
 $i = 1.87426951e-005$
 $j = 1.35018776e-006$
 $f0 = 1000.0$

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	2306.211	1.0001	0.00015
4.5000	2490.326	4.4997	-0.00028
15.0000	3105.926	15.0003	0.00031
18.4999	3333.064	18.4997	-0.00015
24.0000	3713.300	24.0001	0.00013
28.9999	4084.263	28.9995	-0.00037
32.5000	4358.795	32.5002	0.00022

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: 3257
CALIBRATION DATE: 07-Sep-17

SBE 21 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

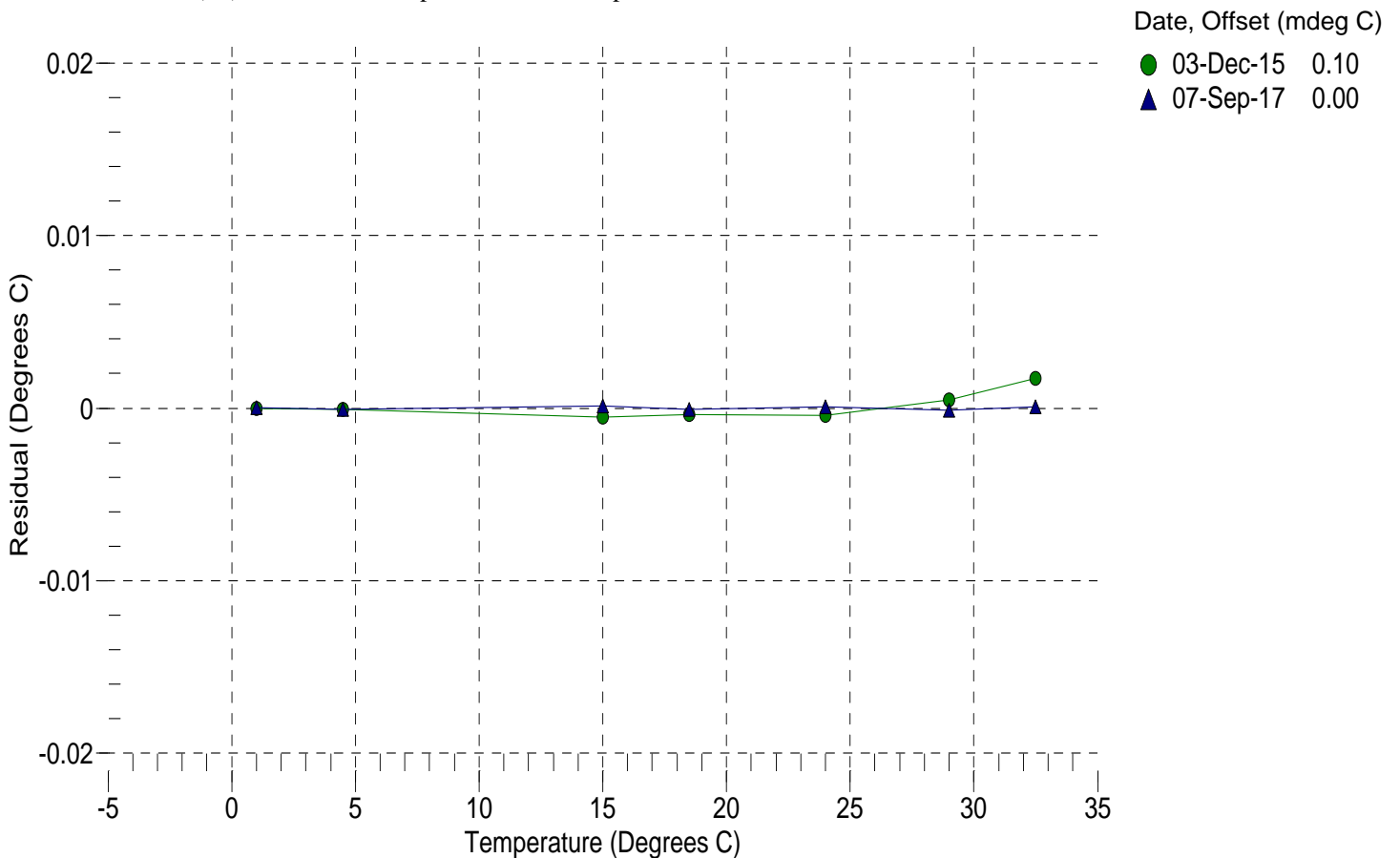
g = 4.16053173e-003
h = 6.28945040e-004
i = 1.94357376e-005
j = 1.57770133e-006
f0 = 1000.0

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	2306.189	1.0000	0.00005
4.5000	2490.316	4.4999	-0.00009
15.0000	3105.895	15.0001	0.00011
18.5000	3333.053	18.4999	-0.00007
24.0000	3713.247	24.0001	0.00006
29.0001	4084.195	29.0000	-0.00013
32.4999	4358.611	32.5000	0.00007

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1 / \{g + h[\ln(f_0 / f)] + i[\ln^2(f_0 / f)] + j[\ln^3(f_0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature





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SBE 21 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -4.17041310e+000
h = 4.91895316e-001
i = -1.24991169e-004
j = 3.30418801e-005

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

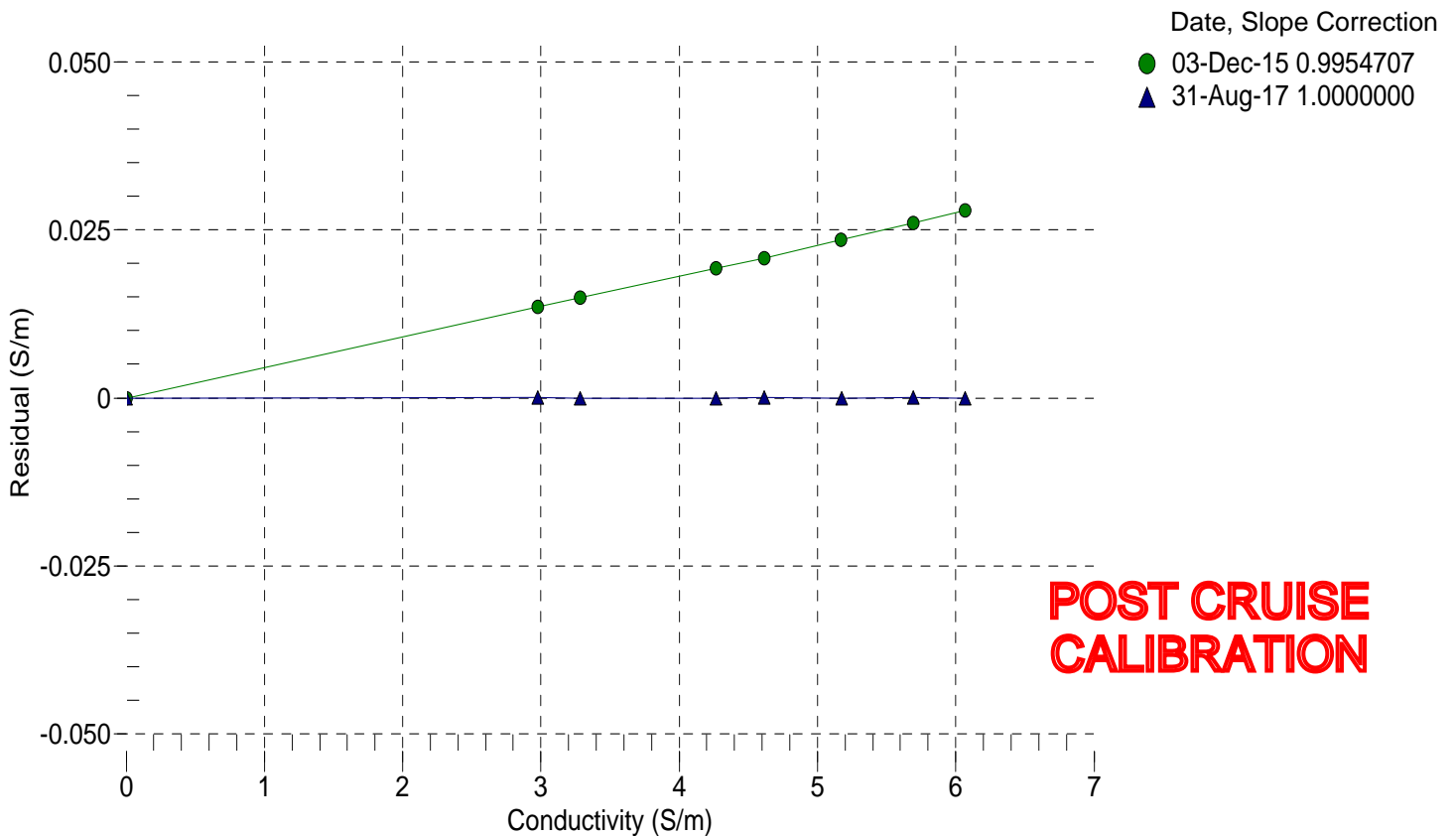
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2.91199	0.00000	0.00000
1.0000	34.8506	2.97862	8.29816	2.97864	0.00002
4.5000	34.8305	3.28593	8.66412	3.28591	-0.00002
15.0000	34.7868	4.26838	9.74098	4.26837	-0.00000
18.4999	34.7775	4.61377	10.09178	4.61377	0.00000
24.0000	34.7669	5.17209	10.63387	5.17208	-0.00001
28.9999	34.7597	5.69408	11.11625	5.69410	0.00002
32.5000	34.7507	6.06584	11.44703	6.06583	-0.00001

f = Instrument Output (kHz)

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

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

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





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SBE 21 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -4.14869408e+000
h = 4.88925071e-001
i = 3.22072897e-005
j = 2.43584212e-005

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

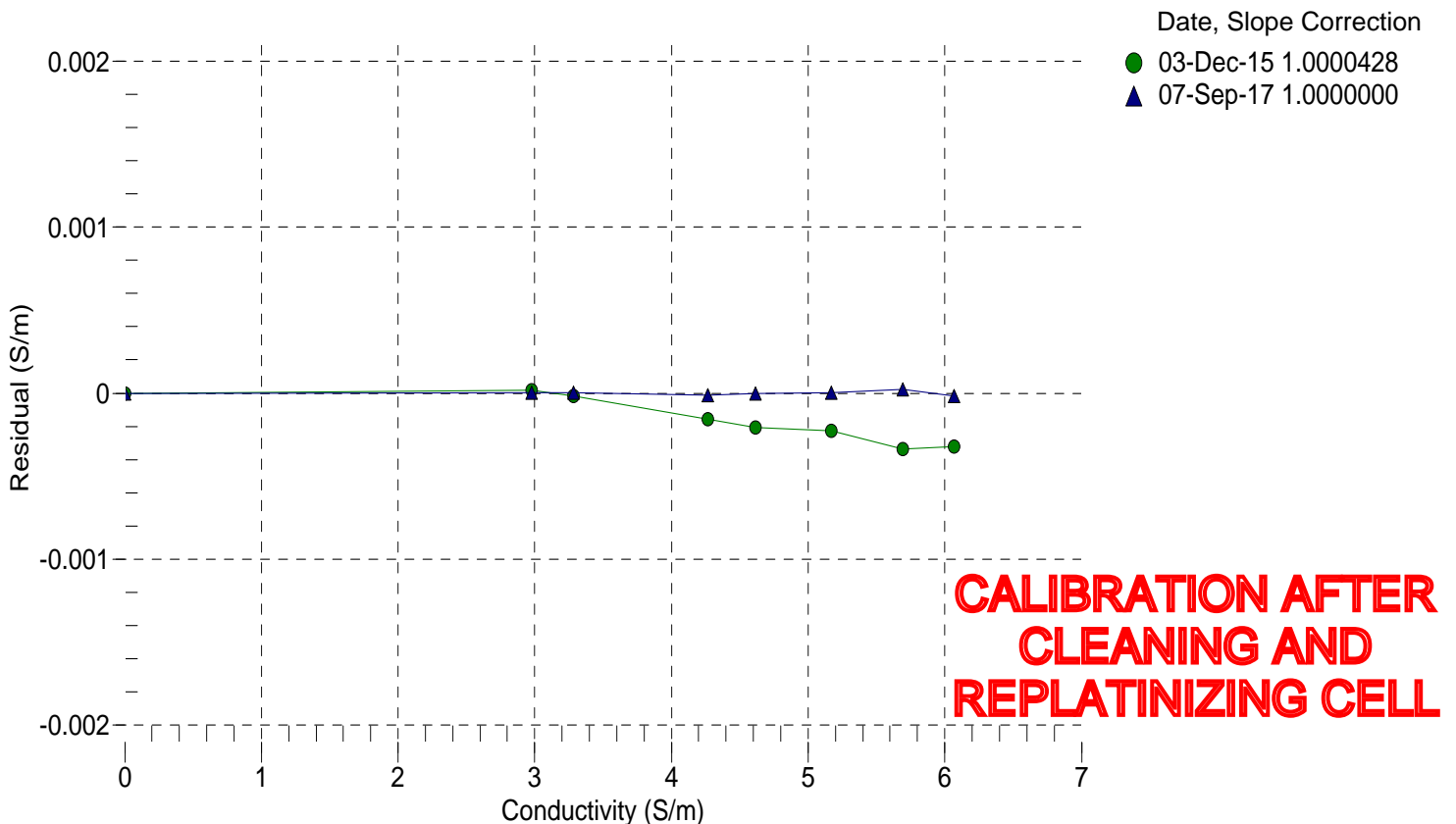
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2.91207	0.00000	0.00000
1.0000	34.8432	2.97804	8.31383	2.97805	0.00000
4.5000	34.8232	3.28531	8.68072	3.28531	0.00000
15.0000	34.7794	4.26757	9.76015	4.26755	-0.00001
18.5000	34.7701	4.61290	10.11187	4.61290	-0.00000
24.0000	34.7596	5.17112	10.65537	5.17113	0.00000
29.0001	34.7532	5.69316	11.13917	5.69318	0.00002
32.4999	34.7480	6.06542	11.47136	6.06540	-0.00002

f = Instrument Output (kHz)

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

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

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





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SENSOR SERIAL NUMBER: 3385
CALIBRATION DATE: 21-Dec-17

SBE 21 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

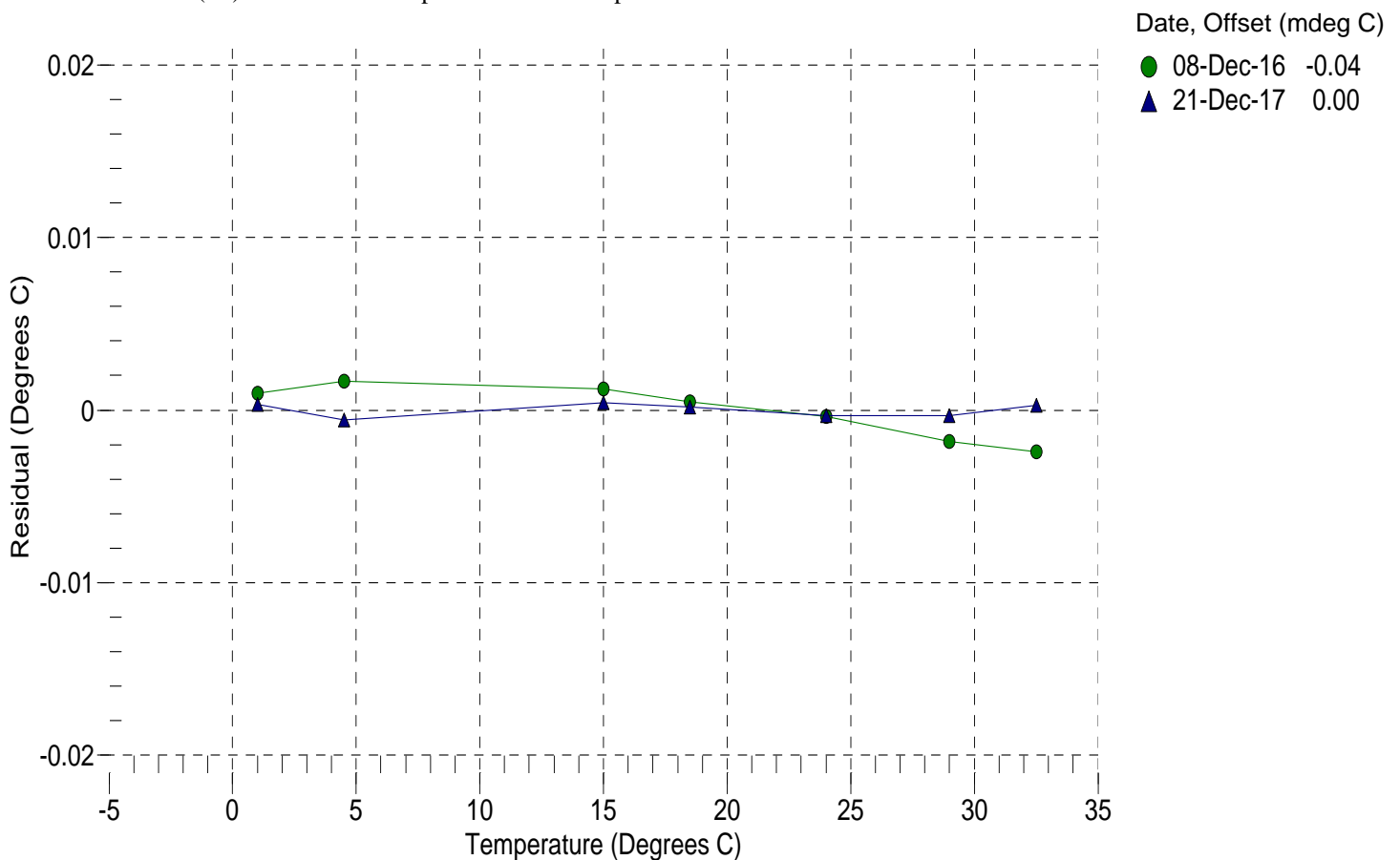
g = 4.15587975e-003
h = 6.08827011e-004
i = 1.92533092e-005
j = 1.60125062e-006
f0 = 1000.0

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	2354.511	1.0003	0.00030
4.5001	2549.363	4.4995	-0.00055
15.0000	3204.719	15.0004	0.00041
18.5001	3447.848	18.5003	0.00017
24.0000	3856.100	23.9997	-0.00030
29.0001	4256.021	28.9998	-0.00032
32.4999	4552.789	32.5002	0.00029

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1 / \{g + h[\ln(f_0 / f)] + i[\ln^2(f_0 / f)] + j[\ln^3(f_0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature





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SBE 21 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

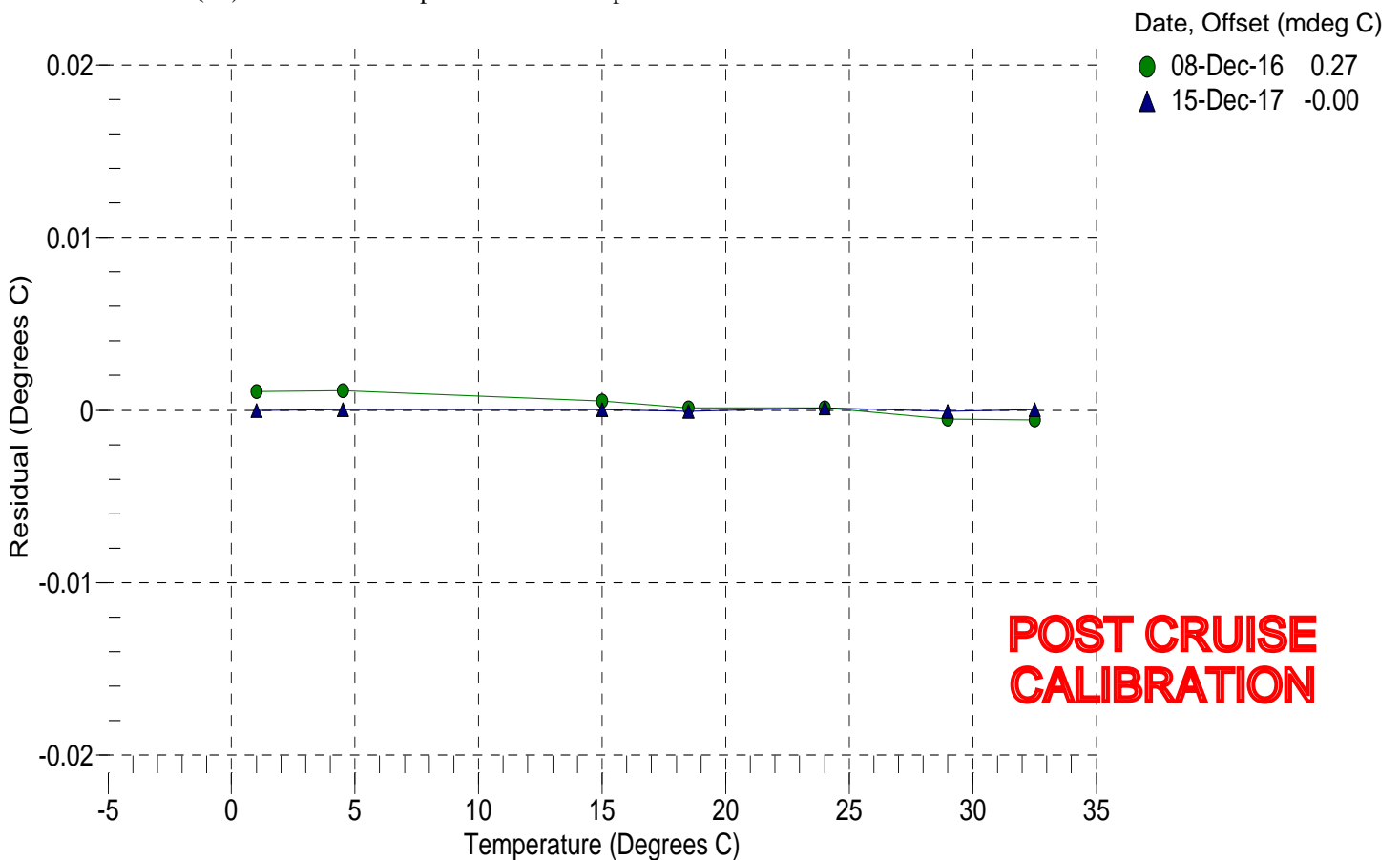
g = 4.15524832e-003
h = 6.07293071e-004
i = 1.80786688e-005
j = 1.31835919e-006
f0 = 1000.0

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	2354.488	1.0000	-0.00000
4.5000	2549.421	4.5000	0.00000
15.0000	3204.742	15.0000	0.00003
18.5000	3447.847	18.4999	-0.00008
24.0000	3856.096	24.0001	0.00012
29.0000	4255.923	28.9999	-0.00009
32.5000	4552.614	32.5000	0.00003

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1 / \{g + h[\ln(f_0 / f)] + i[\ln^2(f_0 / f)] + j[\ln^3(f_0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature





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SBE 21 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -3.98298139e+000
h = 4.67875517e-001
i = 3.77923301e-004
j = 9.13017014e-006

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

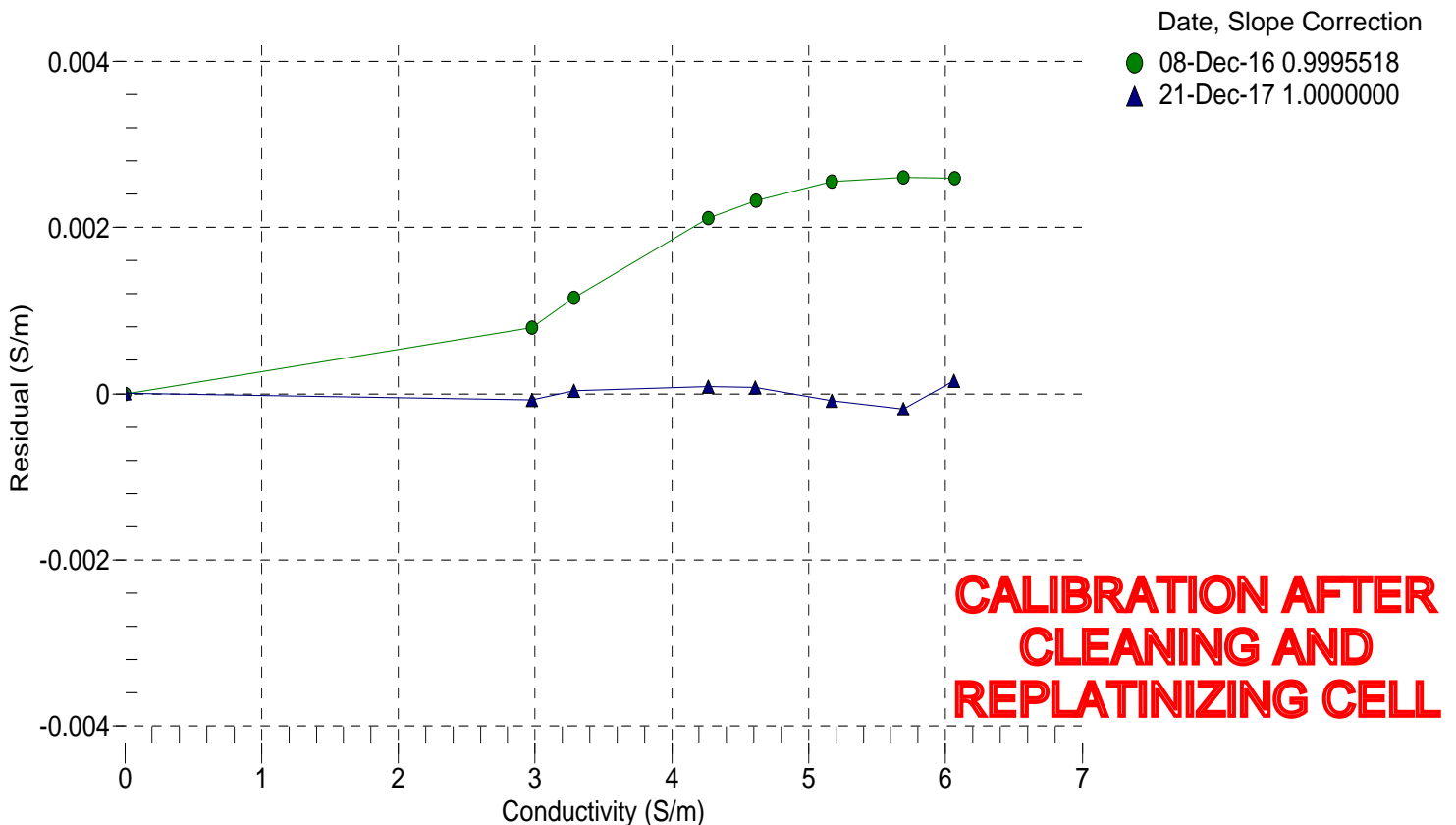
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2.91403	0.00000	0.00000
1.0000	34.8226	2.97645	8.45808	2.97638	-0.00008
4.5001	34.8007	3.28341	8.83268	3.28344	0.00004
15.0000	34.7568	4.26509	9.93457	4.26517	0.00009
18.5001	34.7477	4.61026	10.29351	4.61033	0.00007
24.0000	34.7380	5.16826	10.84807	5.16818	-0.00009
29.0001	34.7325	5.69015	11.34177	5.68996	-0.00019
32.4999	34.7285	6.06240	11.68126	6.06255	0.00015

f = Instrument Output (kHz)

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

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

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





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PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -4.02638987e+000
h = 4.75528166e-001
i = -5.74837410e-004
j = 4.78045318e-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)
22.0000	0.0000	0.00000	2.91374	0.00000	0.00000
1.0000	34.8641	2.97966	8.44653	2.97965	-0.00001
4.5000	34.8434	3.28703	8.82120	3.28706	0.00003
15.0000	34.7996	4.26978	9.92307	4.26973	-0.00005
18.5000	34.7904	4.61530	10.28206	4.61534	0.00004
24.0000	34.7807	5.17392	10.83655	5.17390	-0.00002
29.0000	34.7735	5.69610	11.32984	5.69612	0.00002
32.5000	34.7667	6.06832	11.66831	6.06831	-0.00001

f = Instrument Output (kHz)

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

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

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

