

CRUISE REPORT: PR02S

(Updated Oct 2014)



Highlights

Cruise Summary Information

Section Designation	PR02S (aka: HOT-258, KM1323)
Expedition designation (ExpoCodes)	33KB20131219
Chief Scientists	Brett Updyke / U Hawaii
Dates	2013 Dec 19 - 2013 Dec 23
Ship	R/V <i>Kilo Moana</i>
Ports of call	Snug harbor
Geographic Boundaries	22° 45' N 157° 57.01' W 158° 21.8' W 21° 20.6' N
Stations	4
Floats and drifters deployed	2 short-term drifting arrays deployed
Moorings deployed or recovered	0

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Links To Select Topics

Shaded sections are not relevant to this cruise or were not available when this report was compiled.

Cruise Summary Information	Hydrographic Measurements
Description of Scientific Program	CTD Data:
Geographic Boundaries	Acquisition
Cruise Track (Figure): PI CCHDO	Processing
Description of Stations	Calibration
Description of Parameters Sampled	Temperature Pressure
Bottle Depth Distributions (Figure)	Salinities Oxygens
Floats and Drifters Deployed	Bottle Data
Moorings Deployed or Recovered	Salinity
	Oxygen
Principal Investigators	Nutrients
Cruise Participants	Carbon System Parameters
	CFCs
Problems and Goals Not Achieved	Helium / Tritium
Other Incidents of Note	Radiocarbon
Underway Data Information	References
Navigation Bathymetry	
Acoustic Doppler Current Profiler (ADCP)	
Thermosalinograph	
XBT and/or XCTD	
Meteorological Observations	Acknowledgments
Atmospheric Chemistry Data	
Data Processing Notes	

HOT 258: Chief Scientist Report

Chief Scientist: Brett Updyke

R/V Kilo Moana

December 19 – December 23, 2013

Cruise ID: **KM1323**

Departed: 19 December at 0845 (HST)

Returned: 23 December at 0746 (HST)

Vessel: *R/V Kilo Moana*

Master of the Vessel: Captain Gray Drewry

OTG Marine Technicians: Trevor Young and Daniel Fitzgerald

1. SCIENTIFIC OBJECTIVES

The objective of the cruise was to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations were to be occupied during the cruise, in the following order:

- 1) Station 1, referred to as Station Kahe, is located at 21° 20.6'N, 158° 16.4'W and was to be occupied on December 19th for about 2 hours.
- 2) Station 2, referred to as Station ALOHA, is defined as a circle with a 6 nautical mile radius centered at 22° 45'N, 158°W. This is the main HOT station and was to be occupied during December 20th- 22nd.
- 3) Station 52, the site of WHOTS-10 Mooring (anchor position 22° 40.12'N 157° 57.01'W) was to be occupied on December 22nd for about one hour.
- 4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W and was to be occupied on December 22nd for approximately 2 hours.

Upon arrival to Station Kahe a 1300 lb. weight-test cast to 500 m, one CTD cast to 1000 m, and a Hyperpro cast were to be conducted on the afternoon of December 19th. The single CTD cast was to be conducted to collect continuous profiles of various physical and chemical parameters. Water samples were to be collected at discrete depths for biogeochemical measurements. After these operations were satisfactorily completed, the ship was to proceed to Station ALOHA.

Upon arrival to Station ALOHA, the free-drifting sediment trap array was to be deployed. The sediment trap array was to stay in the water for about 56 hours. This was to be followed by two net tows and a 1000 m CTD cast for preparation of the Primary Productivity Array. This cast was to be followed by the deployment of the free-drifting Primary Productivity Array to incubate *in situ* for 12 hours. A full-depth (~4740 m) CTD cast was to be conducted after the deployment of the Primary Productivity Array, followed by 1000 m CTD casts at strict 3 hour intervals for at least 36 hours for continuous and discrete data collection, ending with another full-depth CTD cast at 2300 on December 21st.

Another free-drifting array (Gas Array) was to be deployed for 24 hours for incubation experiments on December 21st. The Gas Array was to be recovered on December 22nd.

A plankton net was to be towed between 1000-1400, and 2200-0200 for 30 minute intervals on December 20th and 21st at Station ALOHA.

The Hyperpro was to be deployed for approximately 45 minutes at 1400 hours on December 19th, 20th, and 22nd to collect three profiles during each deployment.

A package including a Wet Labs AC9, a Chelsea Fast Repetition Rate Fluorometer (FRRf), a SeaBird Seacat, and a LISST particle size and distribution analyzer was to be used to profile the upper 200 m at Station ALOHA in the early morning and at 1000 hours on December 22nd.

A trace metal free sample was to be collected by the ATE sampler on December 21st at Station ALOHA.

After the 36 hour burst period of CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating Gas Array and the Sediment Trap Array on the morning of December 22nd.

After recovering the arrays, the ship was to transit to Station ALOHA to conduct an AC9/FRRf cast. After these operations were complete, the ship was to transit to Station 52 to conduct a one-hour 200 m CTD yo-yo cast and surface instrument intercomparisons. After the yo-yo cast was complete, the ship was to transit to Station ALOHA for a Hyperpro cast at 1400 hours.

Once operations at Station ALOHA were complete, the ship was to transit to Station 6, referred to as Station Kaena where a near-bottom CTD cast (~2500 m) was to be conducted to collect salinity and chlorophyll samples for calibration.

After Station Kaena operations were complete, the ship was to transit back to Snug Harbor.

The following instruments were to collect data throughout the cruise: shipboard ADCP, thermosalinograph, *p*CO₂ system, underway fluorometer and the meteorological suite.

2. SCIENCE PERSONNEL

Participant	Title	Affiliation
Dan Sadler	Research Associate	UH
Karin Björkman	Research Specialist	UH
Blake Watkins	Marine Engineer	UH
Susan Curless	Research Associate	UH
Adriana Harlan	Research Associate	UH
Brett Updyke	Research Associate	UH
Benedetto Barone	Postdoctoral Researcher	UH
Stuart Goldberg	Postdoctoral Researcher	UH
Jefrey Snyder	Marine Technician	UH
Joseph Gum	Research Associate	UH
Cameron Fumar	Research Associate	UH
Daniel McCoy	Research Associate	UH
Damion Rosbrugh	Undergraduate Student	UH
Ken Doggett	Research Associate	UH
Anne Thompson	Scientist	B/D Biosciences
Erica Goetze	Assistant Professor	UH
Russ Hopcroft	Professor	UAF
Chris Schvarcz	Graduate Student	UH
Sara Thomas	Graduate Student	UH
Trevor Young	Marine Technician	OTG
Dan Fitzgerald	Marine Technician	OTG

3. GENERAL SUMMARY

Operations at Station ALOHA were conducted as planned. One 1000 m CTD cast was completed at Station Kahe. Two near bottom CTD casts and thirteen 1000 m CTD casts were conducted at Station ALOHA. One 200 m yo-yo CTD cast was completed near the WHOTS mooring (Station 52) with three cycles completed. One near bottom cast was completed at Station Kaena.

The Dynacon trawl winch with the 0.681" wire and the A-frame were used for CTD operations.

The Sediment Traps, Primary Productivity Array and Gas Array were all deployed and recovered successfully.

Six net tows for the core HOT zooplankton collection were completed successfully; three during the day, and three during the night. Thirteen net tows for ancillary copepod egg production and metagenetic experiments were completed successfully.

Hyperpro casts (3 cycles each) were conducted on December 19th, December 20th, and December 22nd.

The optical package ACS/AC9/FRRf/LISST was deployed twice (2 cycles each) on December 22nd in the early morning and at 1000 hours.

The ATE sampler was deployed and one trace metal free seawater sample was collected.

The underway thermosalinograph, fluorometer and the ship's meteorological suite ran without interruption during the cruise. The Ultrasonic anemometer showed wind direction glitches sporadically during the cruise. The broad band/narrow band Ocean Surveyor ADCP and the Workhorse ADCP were working correctly, however the underway $p\text{CO}_2$ system was not operational during the cruise.

Winds were from the east starting at 15 kts and decreased throughout the cruise to about 6 knots on December 22nd. Seas were slight to moderate with a 6-8 ft swell.

4. R/V *Kilo Moana* OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V *Kilo Moana* continues to maintain good ship support for our work. Captain Gray Drewry and the ship's crew showed enthusiasm, concern, and dedication to our scientific mission.

Technical support during this cruise was good. OTG personnel were available to assist in our work during the cruise.

5. DAILY REPORT OF ACTIVITIES (HST)

December 19, 2013

0845 - Depart Snug harbor

0915 - Safety briefing with the Captain

1000 - Fire and boat drill

1138 - Arrive at Station Kahe

1143 - Start weight cast to 500 m

1229 - End weight cast

1254 - Start S1C1 CTD cast to 1000 m

1413 - End S1C1

1421 - Start Hyperpro cast

1458 - End Hyperpro cast
1502 - Transit to Station ALOHA
2258 - Arrive at Station ALOHA
2303 - Start sediment traps deployment
2323 - Sediment traps deployed (22° 44.991' N, 158° 03.227' W)
2337 - Start net tow for Erica Goetze

December 20, 2013

0010 - End net tow
0011 - Start net tow (Erica Goetze)
0044 - End net tow
0150 - Start S2C1 CTD cast to 1000 m
0313 - End S2C1
0421 - Start primary productivity array deployment
0436 - Primary productivity array deployed (22° 45.011' N, 158° 02.028' W)
0438 - Transit to center of ALOHA
0501 - Start S2C2 CTD cast to near-bottom
0658 - 10 m off bottom (22° 45.053' N, 157° 59.979' W)
0857 - End S2C2
0900 - Transit to pump tanks
1010 - Start net tow (HOT)
1040 - End net tow
1114 - Start S2C3 CTD cast to 1000 m
1242 - End S2C3
1318 - Start net tow (Erica Goetze)
1352 - End net tow
1402 - Start Hyperpro cast
1443 - End Hyperpro
1455 - Start S2C4 CTD cast to 1000 m
1611 - End S2C4
1650 - Start S2C5 CTD cast to 1000 m
1805 - End S2C5
1830 - Start Primary Productivity array recovery
1838 - Ship's line fell off the array
1858 - Start 2nd recovery attempt
1912 - PP array recovered (22° 43.921' N, 158° 02.291' W)
1915 - Transit to pump ship's tanks
2000 - Start S2C6 CTD cast to 1000 m
2129 - End S2C6
2159 - Start net tow #1 (HOT)
2228 - End net tow #1 / start net tow #2
2257 - End net tow #2
2300 - Start S2C7 CTD cast to 1000 m

December 21, 2013

0016 - End S2C7
0026 - Start net tow #1 (Erica Goetze)
0118 - End net tow #1 / Start net tow #2
0148 - End net tow #2
0156 - Start S2C8 CTD cast to 1000 m
0316 - End S2C8

0400 - Deploy gas array (22° 42.57' N, 158° 02.53' W)

0451 - Start S2C9 CTD cast to 1000 m

0618 - End S2C9

0620 - Transit to pump ship's tanks

0755 - Start S2C10 CTD cast to 1000 m

0910 - End S2C10

0957 - Start net tow (HOT)

1030 - End net tow

1035 - Deploy ATE

1058 - Recover ATE

1102 - Start S2C11 CTD cast to 1000 m

1116 - End S2C11

1226 - Start net tow (HOT)

1257 - End net tow

1302 - Start net tow (Erica Goetze)

1333 - End net tow

1334 - Start net tow (Erica Goetze)

1359 - End net tow

1402 - Start net tow (Erica Goetze)

1432 - End net tow

1439 - Start S2C12 CTD cast to 1000 m

1609 - End S2C12

1610 - Transit to pump ship's tanks

1657 - Start S2C13 CTD cast to 1000 m

1810 - End S2C13

1944 - Start net tow (Erica Goetze)

1959 - End net tow

2001 - Start S2C14 CTD cast to 1000 m

2116 - End S2C14

2120 - Transit to center of Station ALOHA

2130 - Start net tow (Erica Goetze)

2200 - End net tow

2208 - Start net tow (HOT)

2238 - End net tow

2243 - Start net tow (Erica Goetze)

2300 - End net tow

2301 - Transit to center of Station ALOHA

2308 - Start S2C15 CTD cast to near-bottom

December 22, 2013

0110 - 5 m off the bottom (22° 44.976' N, 157° 59.987' W)

0254 - End S2C15

0308 - Start AC9/FRRf

0454 - Recover AC9/FRRf

0500 - Transit to Gas Array

0600 - Gas Array recovered (22° 41.994' N, 158° 01.483' W)

0607 - Transit to Sediment Trap Array

0655 - Sediment Trap Array recovered (22° 44.567' N, 158° 03.733' W)

0705 - Transit to pump ship's tanks

0845 - Start S52C1 CTD yo-yo cast to 200 m

0956 - End S52C1

1006 - Start AC9/FRRf profile
 1155 - Recover AC9/FRRf
 1209 - Start net tow (Erica Goetze)
 1220 - End net tow
 1355 - Start Hyperpro profile
 1445 - End Hyperpro
 1500 - Start net tow (Erica Goetze)
 1511 - End net tow
 1514 - Transit to Station Kaena
 2005 - Arrive Station Kaena
 2008 - Start S6C1 CTD cast to near bottom
 2210 - End S6C1
 2215 - Transit to Snug Harbor

December 23, 2013

0653 - Arrive H buoy
 0746 - All fast port side to, full offload

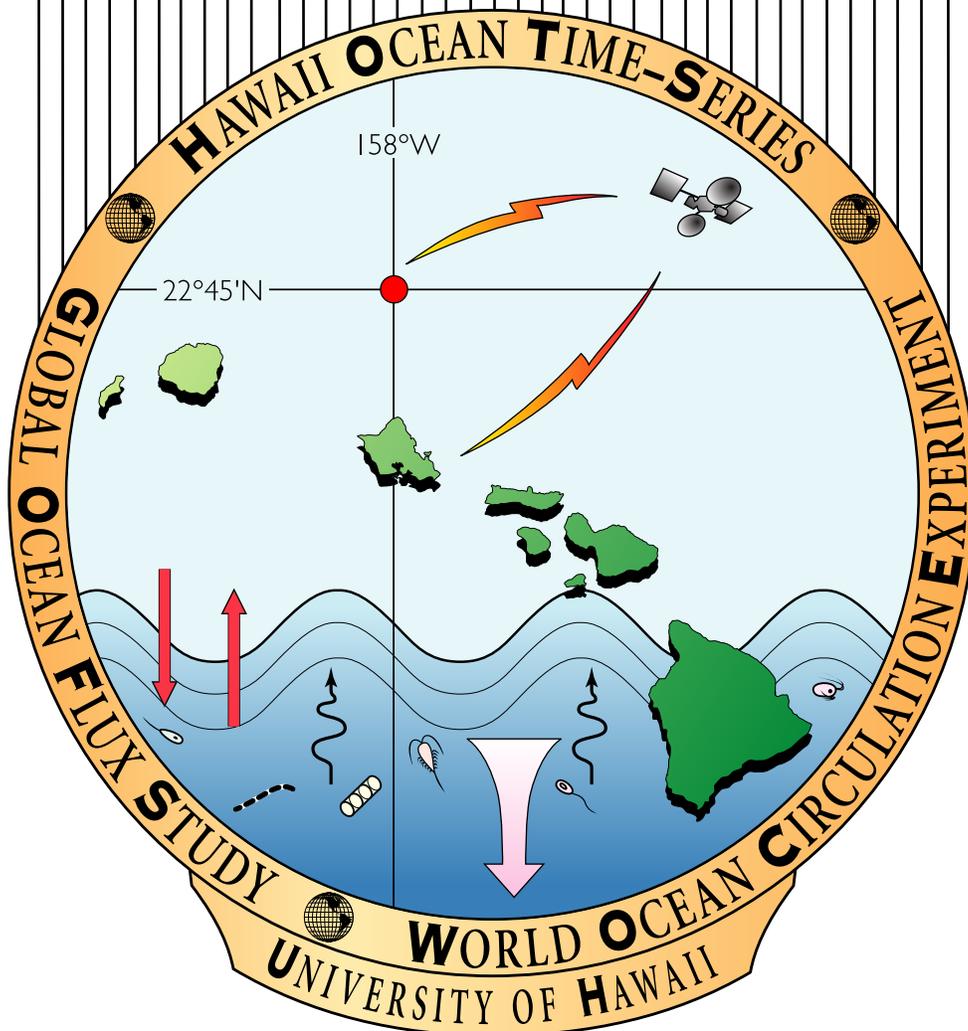
6. HOT program sub-components:

Investigator	Project	Institution
Matt Church Dave Karl Bob Bidigare	Core biogeochemistry	UH
John Dore Roger Lukas Mike Landry Ricardo Letelier	Biogeochemistry QA/QC Hydrography Zooplankton dynamics Optical measurements	MSU UH SIO OSU
Ancillary programs:		
Andrew Dickson	CO ₂ dynamics and intercalibration	SIO
Paul Quay	DI ¹³ C	UW
Matt Church & Ricardo Letelier	Diversity and activities of nitrogen-fixing microorganisms	UH
Sam Wilson	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide	UH
Karin Björkman	Phosphate retention in microbes and size specific bacterial production	UH
Erica Goetze & Russ Hopcroft	Temporal stability of copepod populations at Station ALOHA, metagenetic methods development, egg production experiments, and live imaging	UH, UAF
Ken Doggett & Anne Thompson	Prochlorococcus in the water column	UH, B/D Biosciences

Sara Ferrón-Smith	O ₂ /Argon measurements	UH
Christopher Schvarcz	Viral dynamics in the oligotrophic open ocean, Station ALOHA	UH

Hawaii Ocean Time-series Program

HOT 258



Hawaii Ocean Time-Series

HOT-258

KAHE Station Data Sheet

Station # 1
 Cast # 1
 Operator(s): AH, DS, BU, SG, CS

Date: 12/19/13 (HST)
 Time: 1300 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/Alk	pH	DOC	Nuts	LLN/LLP	Chl <i>a</i>	FCM
1	1000	1	6.7				1			
2	900	2	7.2				2			
3	900	3	7.0				3			
4	750	4,5,6	8.2				4A-B			
5	700	7	7.9				5			
6	600	8	8.3				6			
7	500	9	9.2			7	7			
8	400	10	10.3				8			
9	350	11	11.3			9	9A-B			
10	300	12	15.3				10			
11	250	13	14.6				11			
12	225	14	16.6				12			
13	200	15	17.8			13	13			
14	175	16	18.8			14	14		14	14A-B
15	150	17	20.0			15	15	15	15	15A-B
16	125	18	20.3			16	16A-B		16	16A-B
17	115	19	22.1				17			
18	100	20,21,22	22.5			18	18	18	18A-B	18A-B
19	75	23	24.1			19	19		19	19A-B
20	60	24	24.2				20			
21	45	25	25.4	21	1	21	21	21	21	21A-B
22	25	26	25.5	22	2	22	22		22A-B	22A-B
23	5	27	25.6	23	3,4,5	23	23	23	23	23A-B
24	5	QC	25.8							

Notes: chl bottle and sample number
 14/14, 15/15, 16/16, 18/18a, 25/18b, 19/19, 22/22a, 26/22b, 21/21, 23/23

Hawaii Ocean Time-series

HOT-258

Primary Production Data Sheet

Station # 2
 Cast # 1
 Operator(s): SC, KB

Date: 12-20-13 (HST)
 Time: 0200 (HST)

Rosette Position	Desired Depth	Light Bottle	Chl <i>a</i>	FCM	KB		
1	1000						
2	Sal Min						
3	175		3A-B	3A-B			
4	150		4A-B	4A-B			
5	125	3-1	5	5			
6	125	3-2	6	6			
7	125	3-3	7	7			
8	100	4-1	8	8			
9	100	4-2	9	9			
10	100	4-3	10	10			
11	75	5-1	11	11			
12	75	5-2	12	12			
13	75	5-3	13	13			
14	45	6-1	14	14			
15	45	6-2	15	15			
16	45	6-3	16	16			
17	25	7-1	17	17	X		
18	25	7-2	18	18			
19	25	7-3	19	19			
20	5	8-1	20	20			
21	5	8-2	21	21			
22	5	8-3	22	22			
23							
24							

Notes:

Hawaii Ocean Time-series

HOT-258

WOCE Deep Data Sheet

Station # 2
 Cast # 2
 Operator(s): AH,DS,BU

Date: 12/20/13 (HST)
 Time: 0500 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/ Alk	pH	DOC	Nutrient	Refridg. Si
1	4800	28	3.7				1	1
2	4600	29	3.8				2	2
3	4500	30,31,32	4.4	3A-B	1,2,3	3ABC	3A-B	3A-B
4	4400	33	4.0				4	4
5	4200	34	3.8				5	5
6	4000	35,36,37	4.4			6ABC	6A-B	6A-B
7	3800	38	4.0				7	7
8	3600	39	4.0				8	8
9	3400	40	3.9				9	9
10	3200	149	4.4				10	10
11	3000	42,43,44	4.1	11	4	11ABC	11A-B	11A-B
12	2800	45	4.1				12	12
13	2600	46	4.3				13	13
14	2400	47	4.4				14	14
15	2200	48	5.0				15	15
16	2000	179,50,51	5.1	16	5	16ABC	16A-B	16A-B
17	1800	52	5.0				17	17
18	1600	53	5.4				18	18
19	1400	54	5.8				19	19
20	1200	55	6.4				20	20
21	1000	56	7.0				21	21
22	750	57	8.9				22	22
23	500	58	24.2				23	23
24	5	59					24	

Notes:

Hawaii Ocean Time-series

HOT-258

PO Shallow Data Sheet

Station # 2 Date: 12/20/13 (HST)
 Cast # 3 Time: 1100 (HST)
 Operator(s): AH, BU, DS, SG

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/Alk	pH	DOC	Nutrient	Refridg. Si
1	1020	60,61,62	6.5	1	1	1	1A-B	1A-B
2	976	63	6.5				2	2
3	933	64	6.5				3	3
4	889	65	6.6				4	4
5	845	66	6.7				5	5
6	800	67,68,69	7.2				6	6
7	755	70	7.1	7	2	7	7	7
8	720	71	7.2				8	8
9	685	72	7.4				9	9
10	630	73	7.9				10	10
11	590	74	7.8	11	3	11	11A-B	11A-B
12	545	75	8.4				12	12
13	520	76,77,78	9.3				13	13
14	500	79	8.9	14	4	14	14	14
15	460	80	9.4				15	15
16	420	81	10.2				16	16
17	355	82	11.5	17A-B	5,6	17	17	17
18	315	83,84,85	13.0				18	18
19	263	86	14.5	19	7	19	19	19
20	210	87	16.2				20	20
21	155	88	19.7				21A-B	
22	120	89	21.1				22	
23	85	90	23.5				23	
24	70	91	24.6				24	

Notes:

Hawaii Ocean Time-series

HOT- 258

PC/PN Data Sheet

Station # 2 Date: 12-20-13 (HST)
 Cast # 4 Time: 1400 (HST)
 Operator(s): SC, KB, SG Pre-screen mesh size: 202 um
 Blank #'s B1 B2 B3

Rosette Position	Desired Depth	Carboy #	Total Volume	Sample #	KD		
1	1000						
2	Sal min						
3	350	1	10	3			
4	350	2	10	4			
5	250	3	10	5			
6	200	4	10	6			
7	175	5	10	7			
8	150	6	10	8			
9	125	7,8	4,4	9A-B			
10	100	9	4	10			
11	75	10	4	11			
12	45	11	4	12			
13	25	12,13	4,4	13A-B	X		
14	5	14	4	14			
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

**Notes: KD samples taken from sample bottle 13 (beginning, middle, end)
 Sample #14, two filters, both in same dish**

Hawaii Ocean Time-series

HOT- 258

Particulate Phosphorus Data Sheet

Station # 2 Date: 12-20-13 (HST)
 Cast # 5 Time: 1700 (HST)
 Operator(s): SC, KB, SG Pre-screen mesh size: 202 um
 Blank #'s B1 B2 B3

Rosette Position	Desired Depth	Carboy #	Total Volume	Sample #			
1	1000						
2	Sal min						
3	350	1	10	3			
4	350	2	10	4			
5	250	3	10	5			
6	200	4	10	6			
7	175	5	10	7			
8	150	6	10	8			
9	125	7,8	4,4	9A-B			
10	100	9	4	10			
11	75	10	4	11			
12	45	11	4	12			
13	25	12,13	4,4	13A-B			
14	5	14	4	14			
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

**Notes: Sample #3 has two filters in tube; #4 filter was askew on holder, filtered quickly.
 Sample #6 filter was busted, filtered fast.**

Hawaii Ocean Time-series

HOT-258

BEACH Shallow Data Sheet (1/2)

Station # 2
 Cast # 6
 Operator(s): SC, KB, SG, CS

Date: 12-20-13 (HST)
 Time: 2000 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/ALK	Quay DIC	Keeling DIC	pH	DOC
1	1000	92	6.9					
2	O₂ min	93	7.6					
3	Sal min	94	9.5					
4	200	95	18.1	4			1	4
5	175	96	19.7					5
6	165	97	20.0					
7	150	98	20.5	7			2	7
8	130							
9	125	99	21.2					9
10	115	100	21.3					
11	110							
12	100	101,102,103	21.9	12			3	12
13	90							
14	85	104	23.0					
15	75	105	24.3	15			4	15
16	60							16
17	45	106	24.6	17			5	17
18	35							18
19	25	107	24.7	19			6	19
20	25				20			
21	25							
22	15							22
23	5	108	24.6	23A-B			7,8	23
24	5				24	24A-B		

Notes: Keeling 24A = 210715 @2142
Keeling 24B = 210716 @2144

Hawaii Ocean Time-series

HOT-258

BEACH Shallow Data Sheet (2/2)

Station # 2
 Cast # 6
 Operator(s): SC, KB, SG, CS

Date: 12-20-13 (HST)
 Time: 2000 (HST)

Rosette Position	Desired Depth	Nutrient	Refridg. Si	LLN	LLP	SF-S		
1	1000							
2	O₂ min							
3	Sal min							
4	200	4	4					
5	175	5		5	5			
6	165			6				
7	150	7		7A-B	7			
8	130			8				
9	125	9A-B		9	9			
10	115			10	10			
11	110			11				
12	100	12		12A-B	12			
13	90			13				
14	85			14	14			
15	75	15		15	15			
16	60	16		16	16			
17	45	17A-B		17	17			
18	35	18		18				
19	25	19		19	19			
20	25							
21	25					X		
22	15	22		22				
23	5	23		23A-B	23			
24	5							

Notes:

Hawaii Ocean Time-series

HOT-258

PUR Data Sheet

Station # 2

Date: 12-20-13 (HST)

Cast # 7

Time: 2300 (HST)

Operator(s): SC, KB

Rosette Position	Desired Depth	Carboy #	Total Volume	PUR	SF-S			
1	1000							
2	Sal Min							
3	175	1	10	3				
4	150	2	10	4				
5	125	7,8	4,4	5A-B				
6	100	9	4	6				
7	75	10	4	7				
8	45	11,12	4,4	8A-B				
9	25	3	10	9				
10	25				X			
11	5	4	10	11				
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

Notes:

Hawaii Ocean Time-series

HOT- 258

Gas Array Experiment Data Sheet

Station # 2
 Cast # 8
 Operator(s): SC, KB

Date: 12-21-13 (HST)
 Time: 0200 (HST)

Rosette Position	Desired Depth	15N2	SF-S				
1	1000						
2	Sal Min						
3	125	X					
4	125	X					
5	100	X					
6	100	X					
7	75	X					
8	75	X					
9	45	X					
10	45	X					
11	25	X					
12	25	X					
13	25		X				
14	5	X					
15	5	X					
16							
17							
18							
19							
20							
21							
22							
23							
24							

Notes:
BOTTLE # 7,13 VENT OPENED

Hawaii Ocean Time-series

HOT-258

OPEN CAST Data Sheet

Station # 2
 Cast # 9
 Operator(s): AH,DS,BU

Date: 12/21/13 (HST)
 Time: 0500 (HST)

Rosette Position	Desired Depth	KD	Salts	SF-S			
1	1000		X				
2	Sal Min		X				
3	200	X					
4	175	X					
5	160	X					
6	150	X					
7	145	X					
8	140	X					
9	135	X					
10	130	X					
11	125	X					
12	120	X					
13	115	X					
14	110	X					
15	105	X					
16	100	X					
17	95	X					
18	90	X					
19	85	X					
20	75	X					
21	65	X					
22	45	X					
23	25	X		X			
24	5	X	X				

Notes:

Hawaii Ocean Time-series

HOT- 258

Particulate Silica Data Sheet

Station # 2 Date: 12/21/13 (HST)
 Cast # 10 Time: 0800 (HST)
 Operator(s): AH,DS,BU,SG Pre-screen mesh size: none
 Blank # **B1, B2, B3**

Rosette Position	Desired Depth	Carboy #	Total Volume	Sample #	MC	SF-S	
1	1000						
2	Sal min						
3	175	7	4	3			
4	175				X		
5	150	8	4	5			
6	150				X		
7	125	9,10	4,4	7A-B			
8	125				X		
9	100	11	4	9			
10	100				X		
11	75	12	4	11			
12	75				X		
13	45	13	4	13			
14	45				X		
15	25	14,15	4,4	15A-B			
16	25				X		
17	25					X	
18	5	16	4	17			
19	5				X		
20							
21							
22							
23							
24							

Notes:

Hawaii Ocean Time-series

HOT- 258

OPEN Data Sheet

Station # 2
 Cast # 11
 Operator(s): AH,DS,BU

Date: 12/21/13 (HST)
 Time: 1110 (HST)

Rosette Position	Desired Depth	CS	SF-S				
1	1000						
2	Sal Min						
3	175	X					
4	175	X					
5	150	X					
6	150	X					
7	125	X					
8	125	X					
9	100	X					
10	100	X					
11	75	X					
12	75	X					
13	45	X					
14	45	X					
15	25	X					
16	25	X					
17	25		X				
18	5	X					
19	5	X					
20							
21							
22							
23							
24							

Notes:

Hawaii Ocean Time-series

HOT- 258

ATP Data Sheet

Station # 2 Date: 12-21-13 (HST)
 Cast # 12 Time: 1443 (HST)
 Operator(s): SC, KB, SG Pre-screen mesh size: 202um
 Blank #'s 28, 29, 30

Rosette Position	Desired Depth	ATP Tube #'s	Volume Filtered	Carboy #	MC	SW	KB	SF-S
1	1000					X		
2	900					X		
3	800					X		
4	770				X			
5	700					X	X	
6	600					X		
7	500					X		
8	500				X			
9	Sal min							
10	400					X		
11	350	1 – 3	3x2	1				
12	300					X		
13	300				X			
14	250	4 – 6	3x2	2				
15	200					X		
16	200				X			
17	150	7 – 9	3x1	7				
18	125	10 – 12	3x1	8				
19	100	13 – 15	3x1	9				
20	75	16 – 18	3x1	10				
21	45	19 – 21	3x1	11				
22	25	22 – 24	3x1	12				
23	25							X
24	5	25 - 27	3x1	13				

**Notes: Tube 2 and 3 went dry at end
 Tube 15 did not boil.**

Hawaii Ocean Time-series

HOT-258

OPEN CAST Data Sheet

Station # 2
 Cast # 13
 Operator(s): SC, KB, SG

Date: 12-21-13 (HST)
 Time: 1700 (HST)

Rosette Position	Desired Depth	MC	SW	SF-S			
1	1000						
2	Sal Min						
3	175	X	X				
4	150	X	X				
5	125	X	X				
6	100	X	X				
7	75	X	X				
8	45	X	X				
9	25	X	X				
10	25			X			
11	5	X	X				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

Notes:

Hawaii Ocean Time-series
HOT-258
HPLC & Chl *a*. Bottle Data Sheet

Station # 2
 Cast # 14
 Operator(s): SC, KB

Date: 12-21-13 (HST)
 Time: 2010 (HST)

Rosette Position	Desired Depth	Carboy #	Total Volume	HPLC	Chl <i>a</i> .	SLIDES	KD	
1	1000							
2	Sal min							
3	175	1	10	3	3			
4	175					X		
5	150	2	10	5	5			
6	150					X		
7	135	7	4	7	7A-B			
8	125	8,9	4,4	8A-B	8			
9	125					X		
10	115	10	4	10	10			
11	100	11	4	11	11			
12	100					X		
13	85	12	4	13	13			
14	75	13	4	14	14			
15	75					X		
16	60	14	4	16	16A-B			
17	45	15,16	4,4	17A-B	17			
18	45					X		
19	25	3	10	19	19		X	
20	25					X		
21	5	4	10	21	21			
22	5					X		
23								
24								

Notes: DO NOT PRE-SCREEN
KD breakthrough experiment w/25m water
Niskins 4,6,7, and 8 vents were open

Hawaii Ocean Time-series

HOT-258

WOCE Deep 2 Data Sheet

Station # 2
 Cast # 15
 Operator(s): SC, KB

Date: 12-21-13 (HST)
 Time: 2300 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	MC	KB			
1	4800	109	3.8					
2	4500	110,111,112	4.2					
3	4000	113,114,115	4.2					
4	4000			X				
5	3000	116,117,118	4.4					
6	3000			X				
7	2000	119,120,121	5.0					
8	2000			X				
9	1000			X				
10	O2 min	122,123,124	6.6					
11	Sal min	125	11.5					
12	O2 max	126	22.6					
13	25				X			
14	5	127	24.5					
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

Notes:

Hawaii Ocean Time-series

HOT- 258

STATION 52 Data Sheet

Station # 52
Cast # 1
Operator(s): AH,DS,BU

Date: 12/22/13 (HST)
Time: 0900 (HST)

Rosette Position	Desired Depth	DIC/TA	pH	KB		
1	25			X		
2	5	2	1,2,3			
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Notes:

Hawaii Ocean Time-series

HOT- 258

STATION Kaena Data Sheet

Station # 6
 Cast # 1
 Operator(s): SC, KB

Date: 12-22-13 (HST)
 Time: 2005 (HST)

Rosette Position	Desired Depth	Chl a.				
1	2500					
2	2000					
3	1500					
4	1000					
5	500					
6	175	6				
7	150	7				
8	125	8				
9	100	9				
10	75	10				
11	45	11				
12	25	12				
13	5	13				
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Notes:

Hawaii Ocean Time-series

HOT-258

Sediment Trap Data Sheet

Type of traps: PIT Date: 12-19-13
Operator(s): SC, BW, KB Wind: _____
Position in: 22°44.994'N 158°3.230'W Sea State: _____

Time in: 150 m X Notes: 2319 Traps in water, 2323 array released
(HST) _____

Operator(s): AH, DS, BU, BW Date: 12/22/13
Position out: 22° 44.461 N 158° 3.694 W Wind: _____
Overall sea state: _____ Sea state: _____

Time Out: 150 m 0700 Notes:
(HST) _____

Data Sheet for Sediment Trap Volumes

Cruise #: 258

Analyst: AH

- Directions:
- 1) Mark the traps with 2 lines
 - a) Line #1 is at the interface
 - b) Line #2 is 2" (5 cm) above the interface
 - 2) Siphon off the top of the trap to Line #2 - 2" above the interface
 - 3) Measure the distance from the bottom of the trap to Line #2 2" above the interface and record the result in this table.

Trap Name	Depth (m)	Height (cm) at Line #2 (Top Line)	Volume (L) at top line = (Height in cm x 0.038)
A	150	36.3	
B	150	37.3	
C	150	38.0	
D	150	39.0	
E	150	39.2	
F	150	39.0	
G	150	38.0	
H	150	38.4	
I	150	37.0	
J	150	39.0	
K	150	40.0	
L	150	37.5	

Hawaii Ocean Time-series HOT-258 In Situ Primary Production Data Sheet

Operator(s): SC, KB, AH, DS, BW, BU

Date in: 12/20/13

Time in: 0436 (HST)

Date out: 12-20-13

Time out: 1905 (HST)

Incubation Depth	✓
<i>175</i>	✓
<i>150</i>	✓
<i>125</i>	✓
<i>100</i>	✓
<i>75</i>	✓
<i>45</i>	✓
<i>25</i>	✓
<i>5</i>	✓

Insertion Depth	Owner
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Position in: 22° 45.012'N 158° 2.000'W

Position out: 22° 43.970'N 158° 2.246'W

Average weather condition during incubation: mostly sunny

Average sea state during incubation: 8-10ft swells

Begin Inoculation _____

End Inoculation _____

Filtration time _____

Hawaii Ocean Time-series HOT-258 In Situ Gas Array Data Sheet

Operators: AH,BW,BU,DS	Operators: AH,BW,BU,DS
Date Deployed: 12/21/13	Date Recovered: 12/22/13
Time (HST): 0420	Time (HST): 0600
Position: 22° 42.555 N 158° 2.455 W	Position: 22° 42.008 N 158° 1.486W

#1 = FRACTION

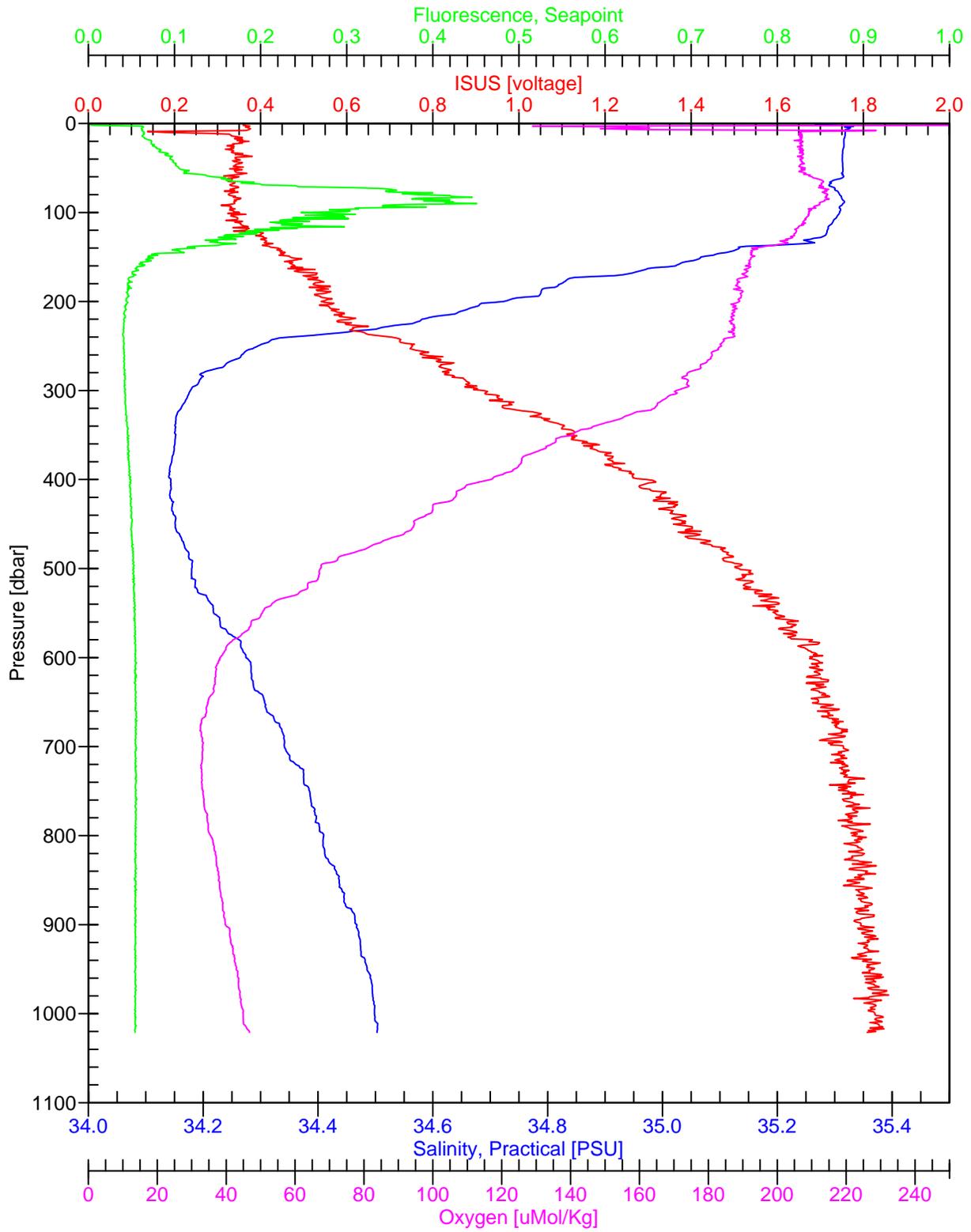
#4 = WHOLE

Nitrogen Fixation Sample Processing Sheet

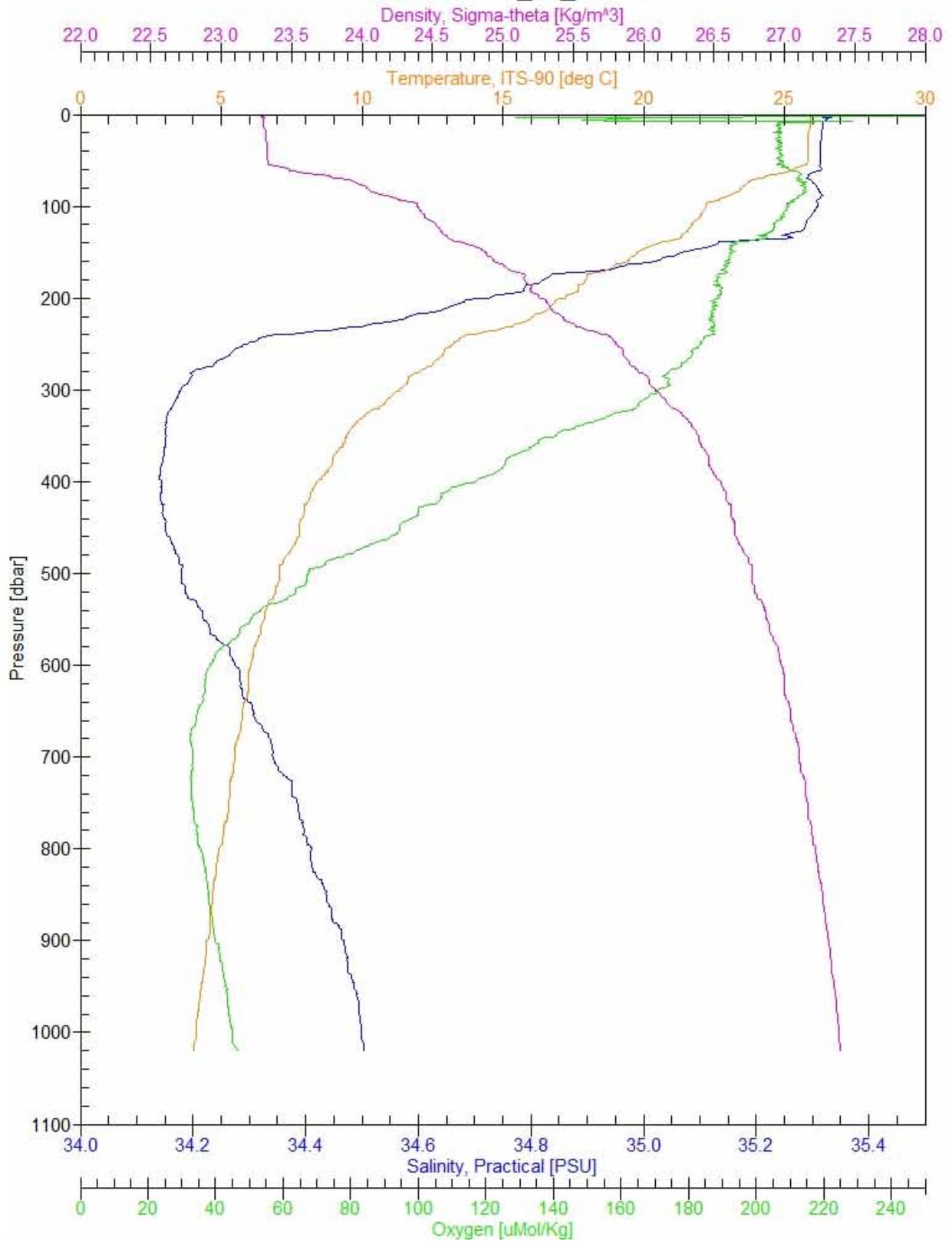
Sample ID	Date Spiked	Time Spiked	Date Filtered	Time Filtered	Comments
3-1	12/21/13	0340	12/22/13	0630	
3-4	12/21/13	0342	12/22/13	0630	
4-1	12/21/13	0343	12/22/13	0630	
4-4	12/21/13	0344	12/22/13	0630	
5-1	12/21/13	0344	12/22/13	0630	
5-4	12/21/13	0347	12/22/13	0710	
6-1	12/21/13	0344	12/22/13	0630	
6-4	12/21/13	0342	12/22/13	0710	
7-1	12/21/13	0342	12/22/13	0630	
7-4	12/21/13	0341	12/22/13	0710	
8-1	12/21/13	0352	12/22/13	0630	26ml N2 water added
8-4	12/21/13	0338	12/22/13	0710	

Are samples also spiked with C13? Yes No

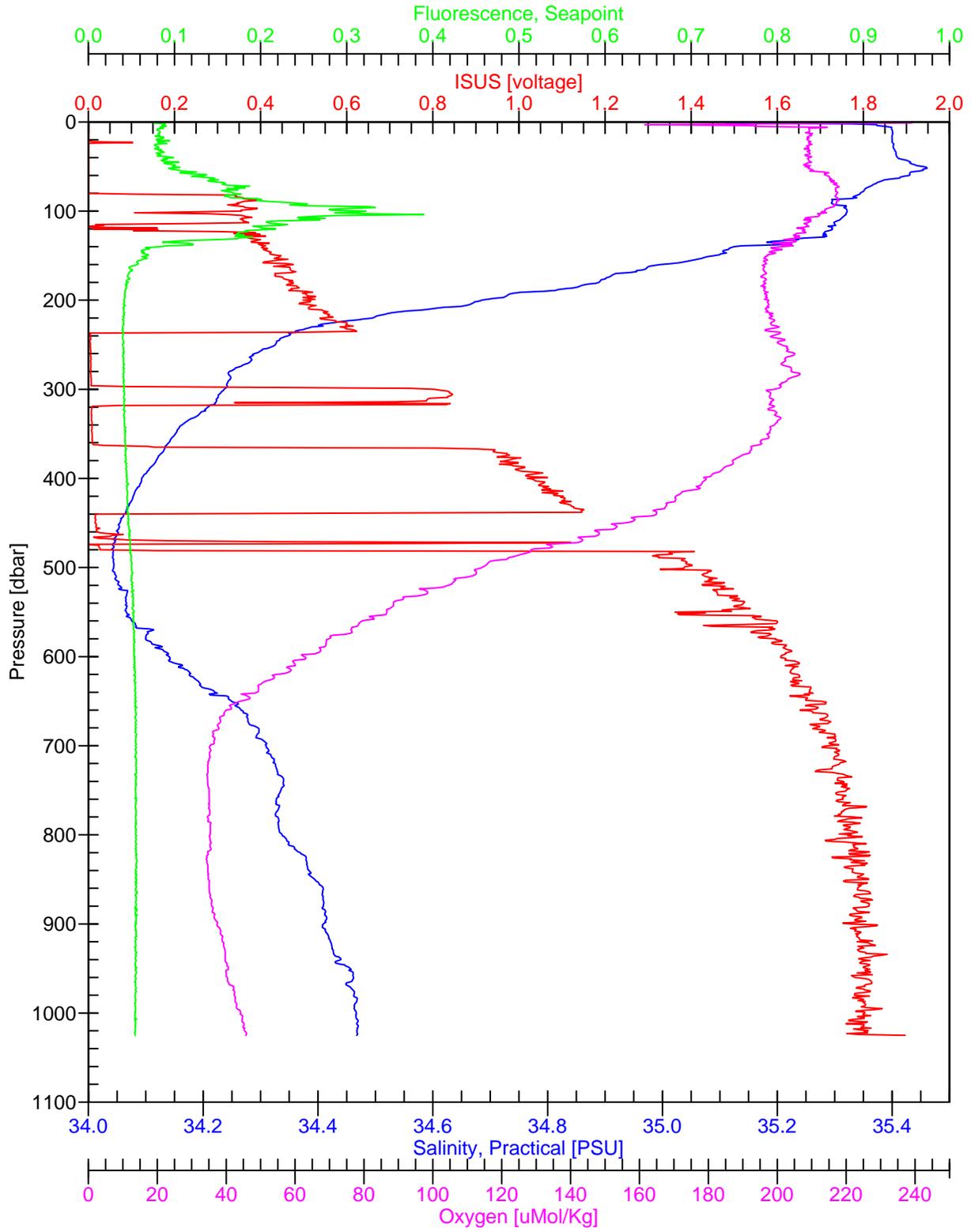
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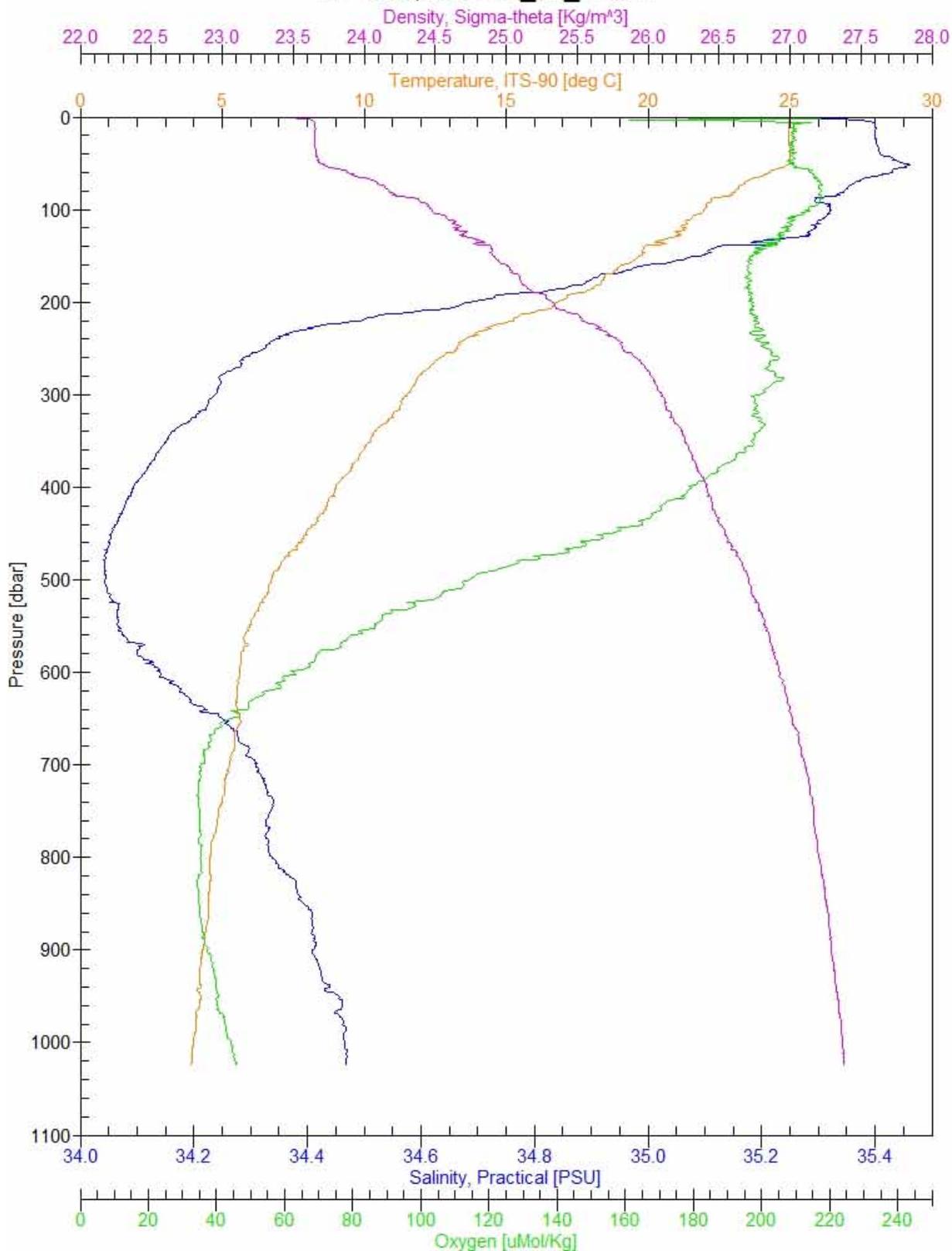
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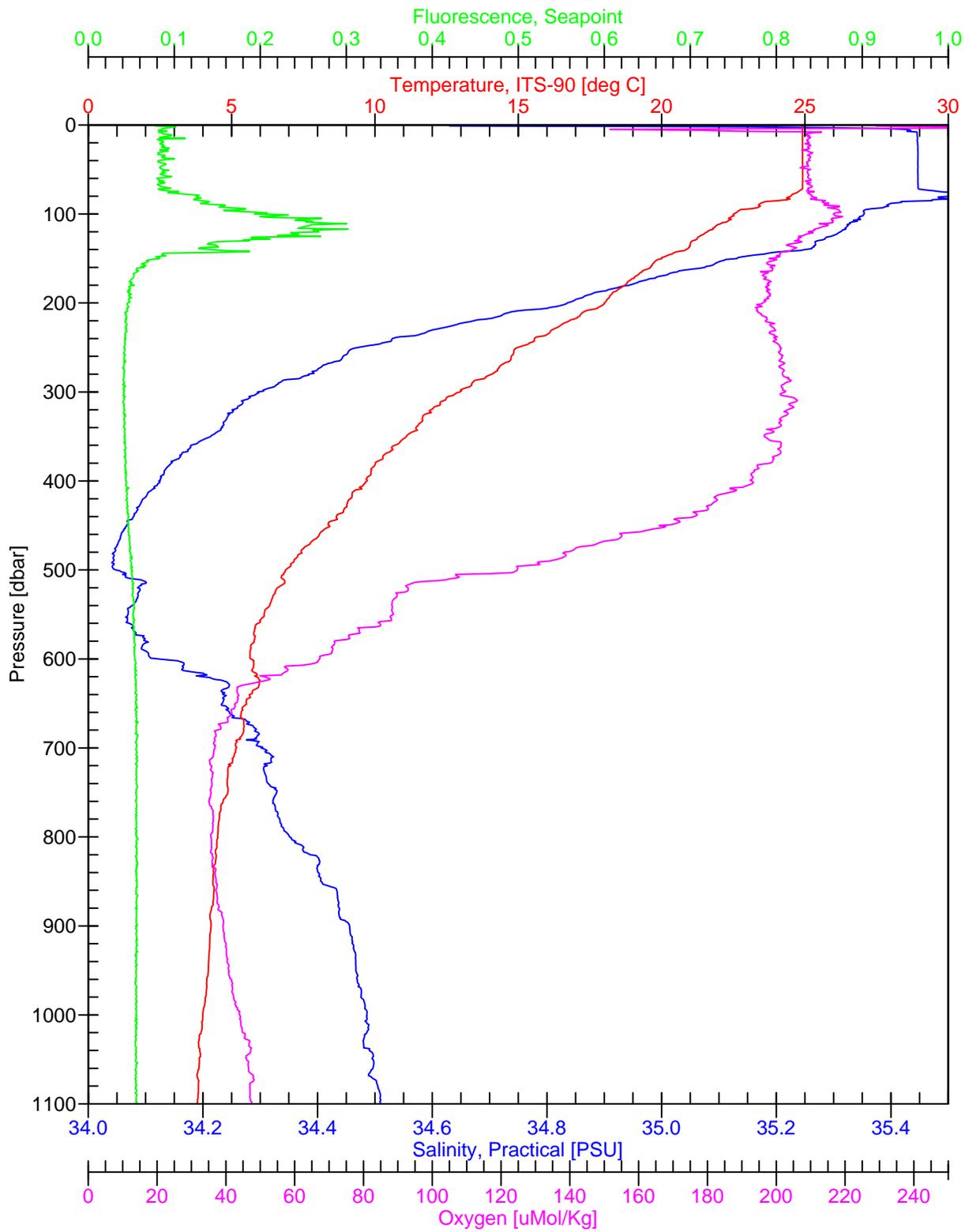
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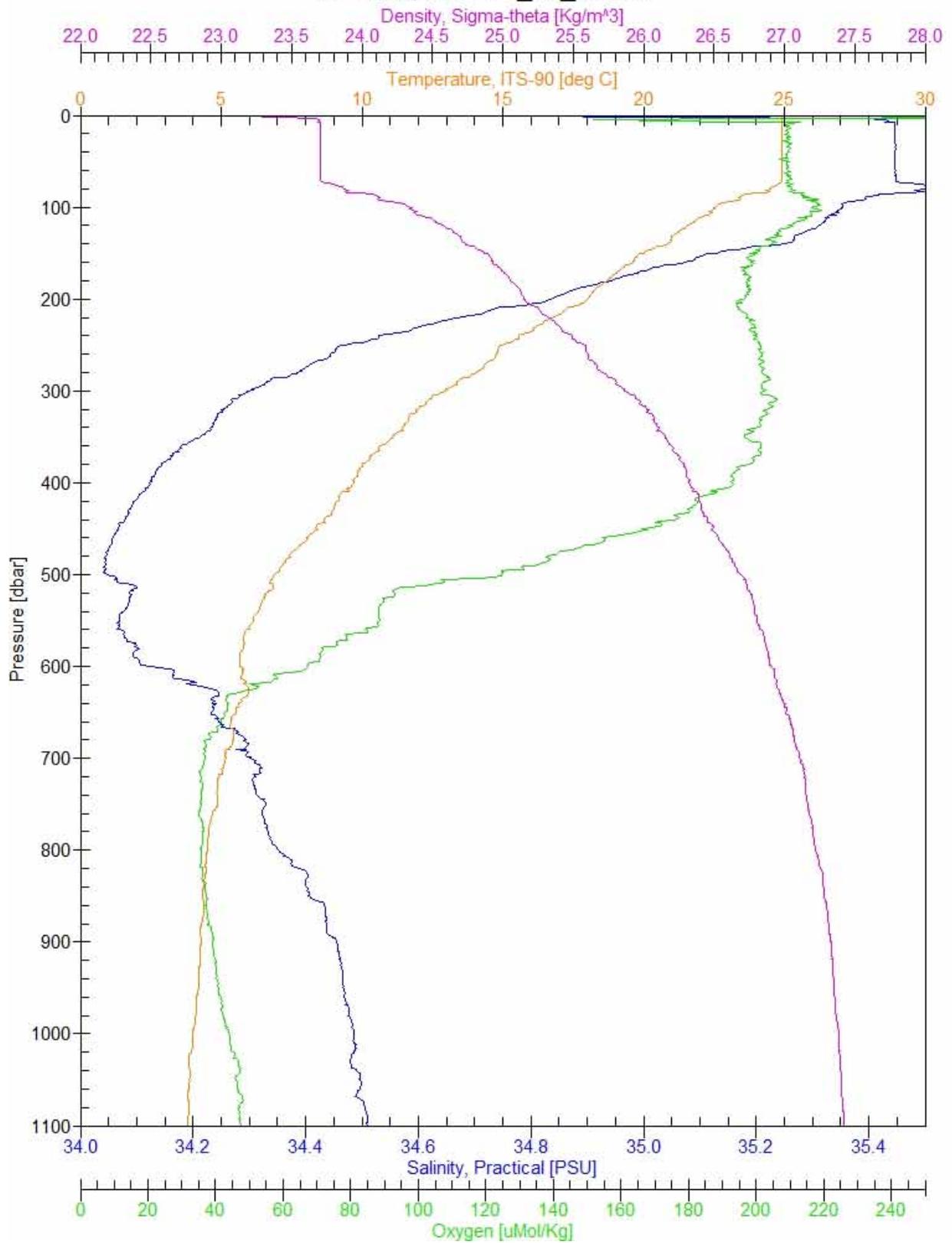
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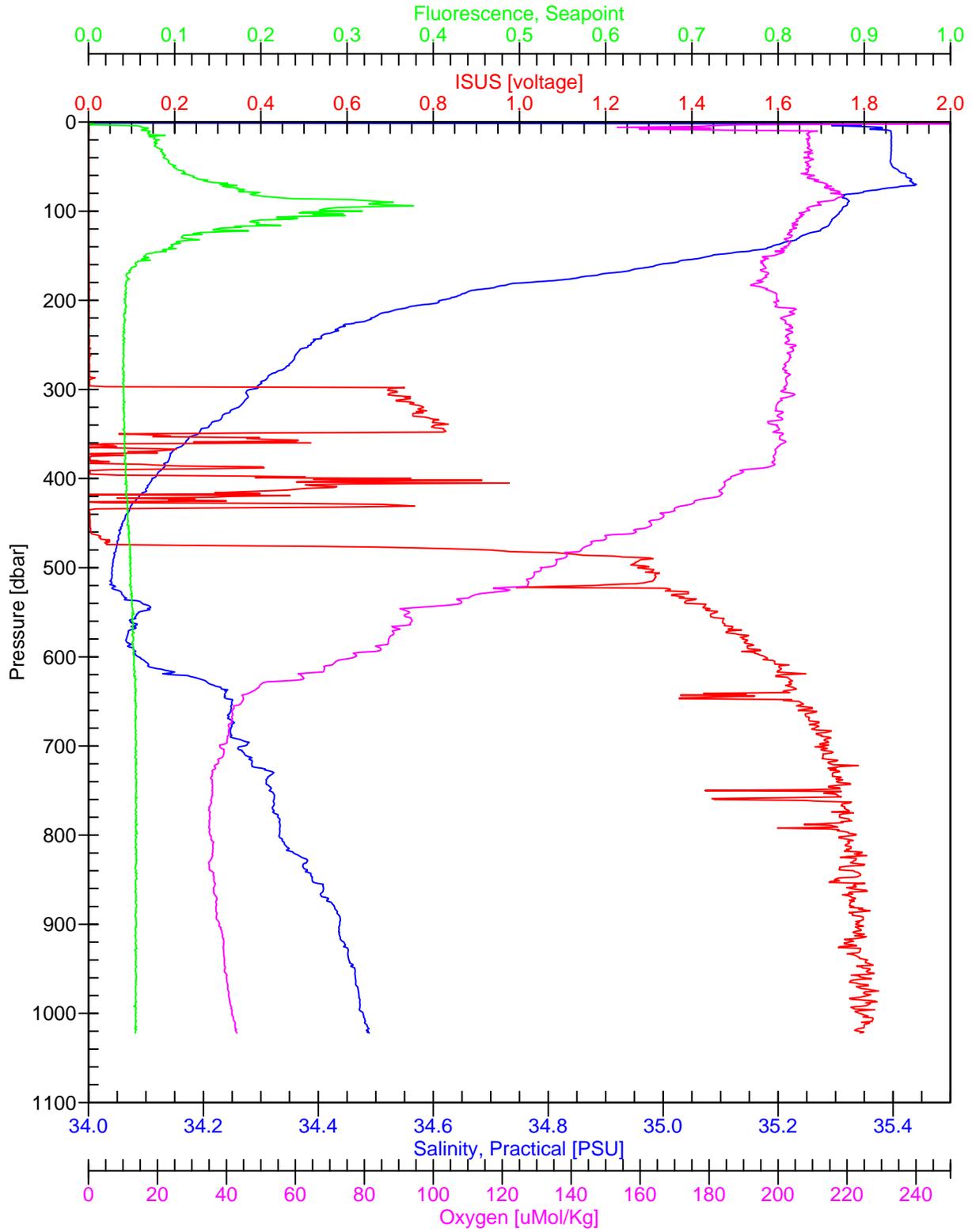
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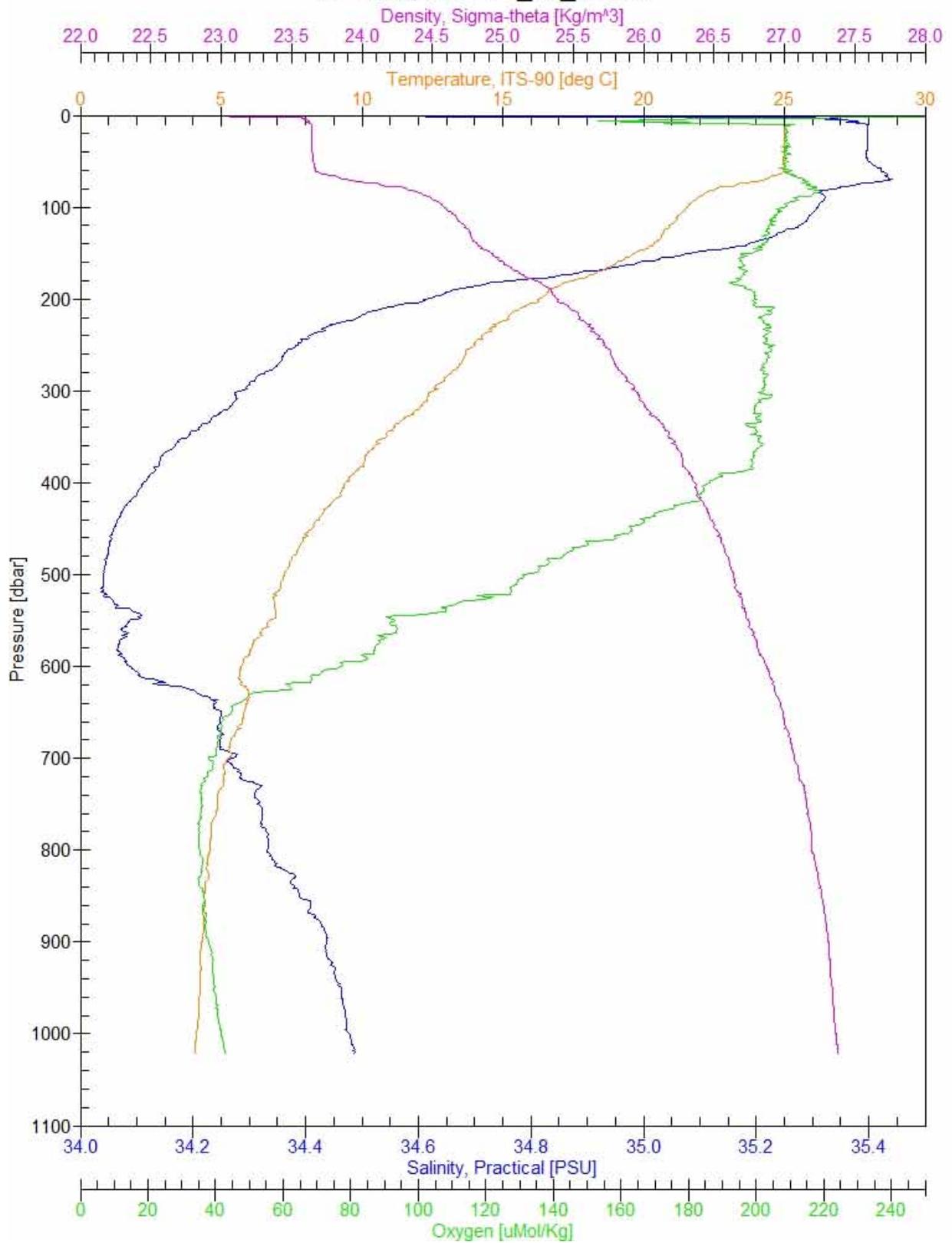
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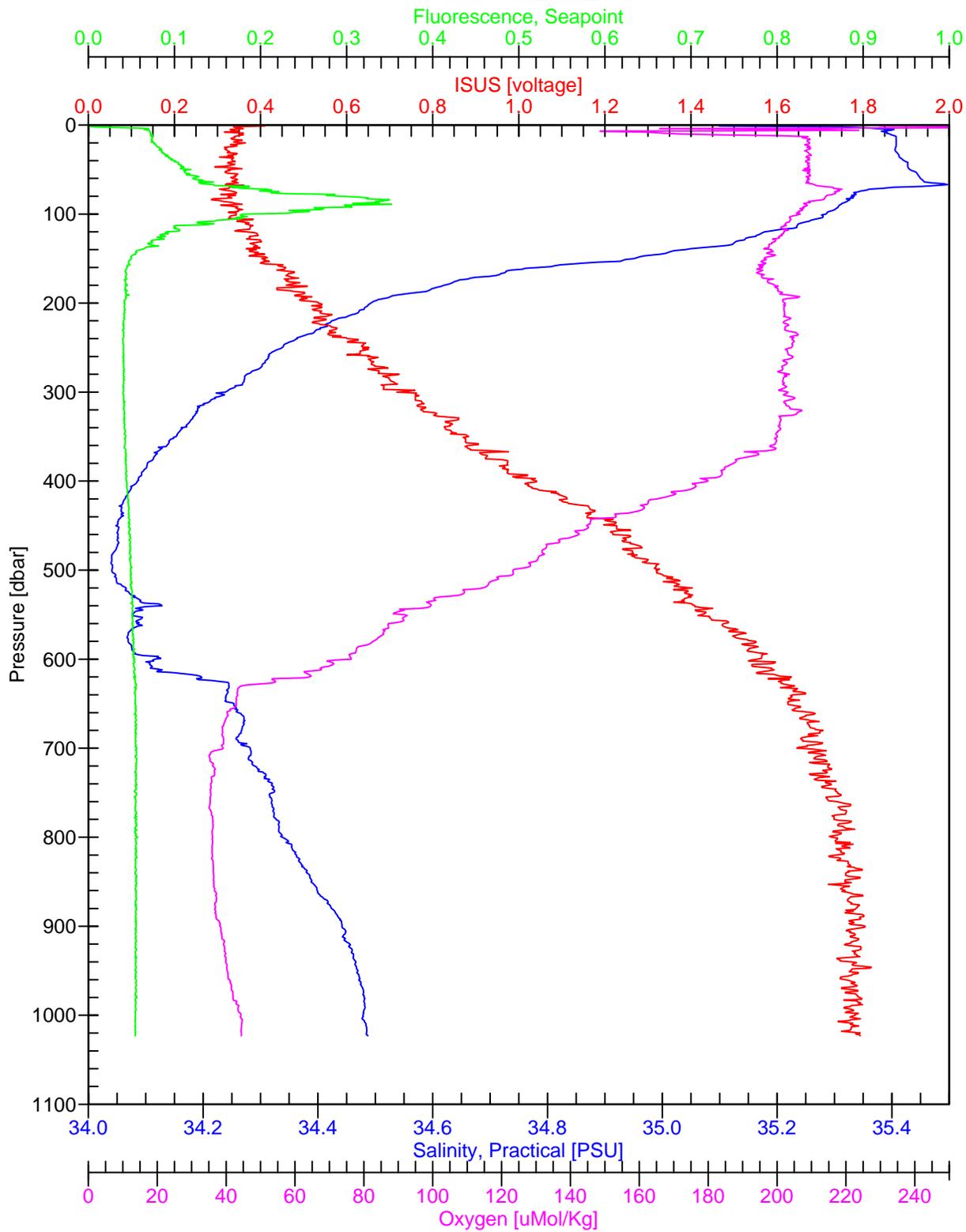
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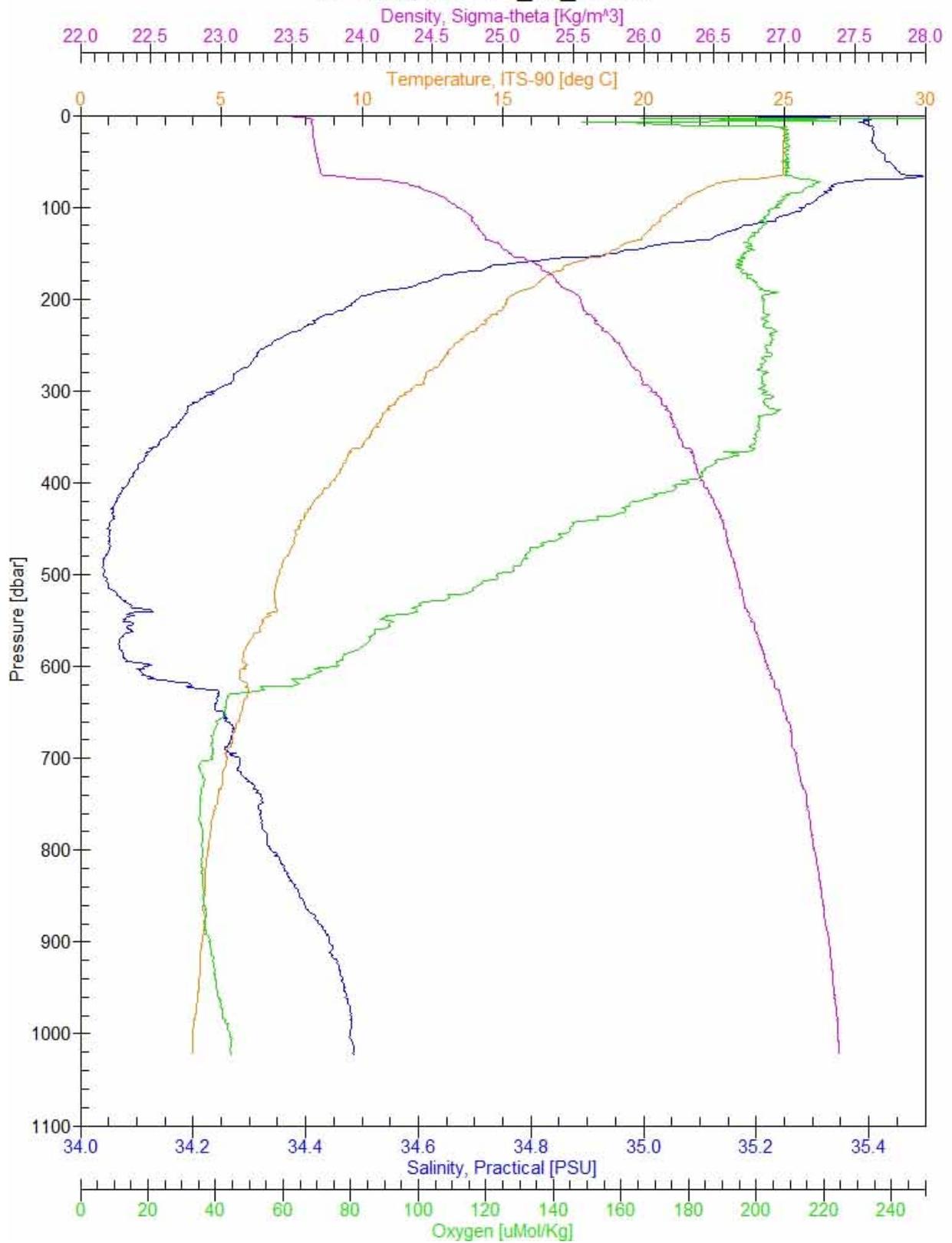
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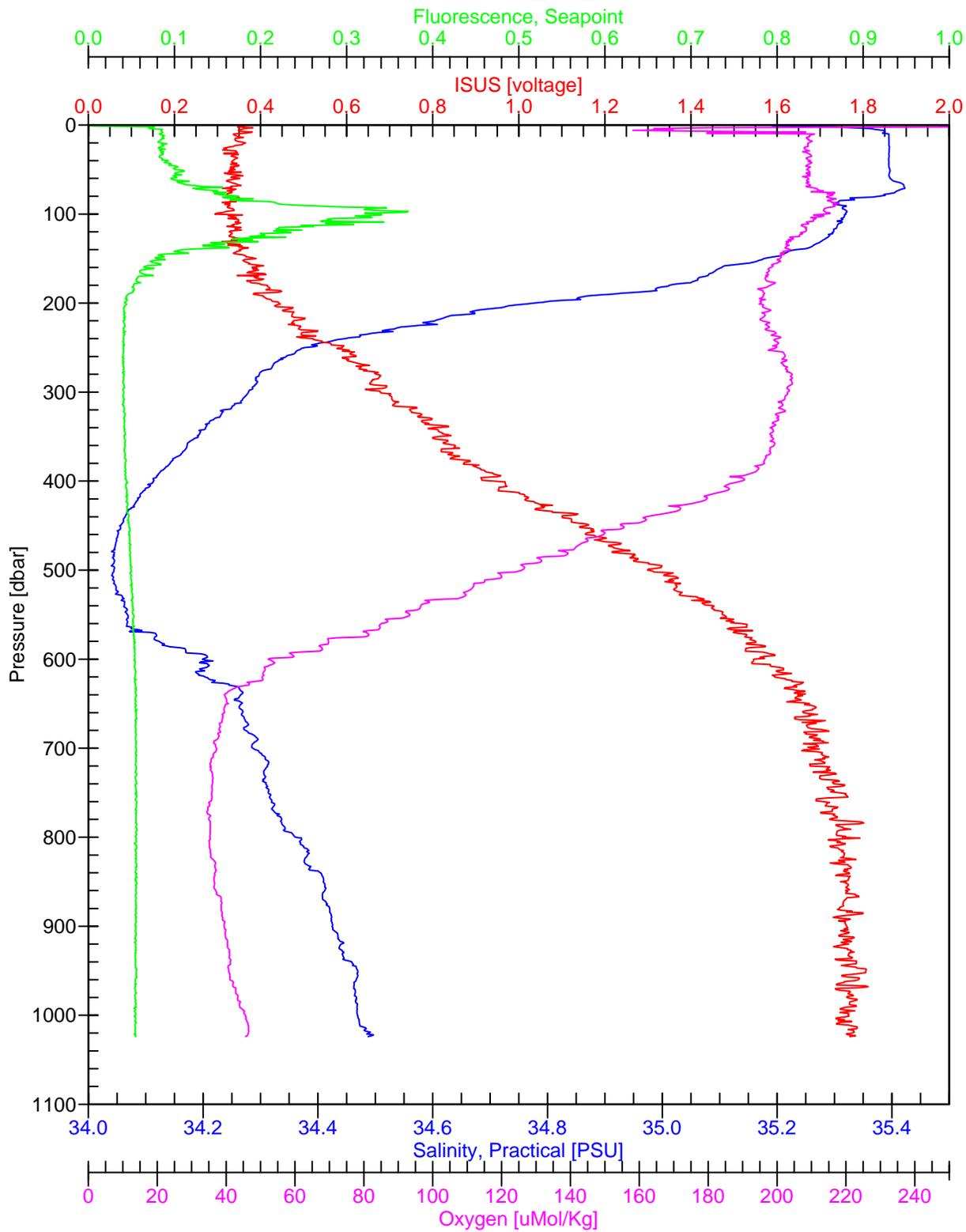
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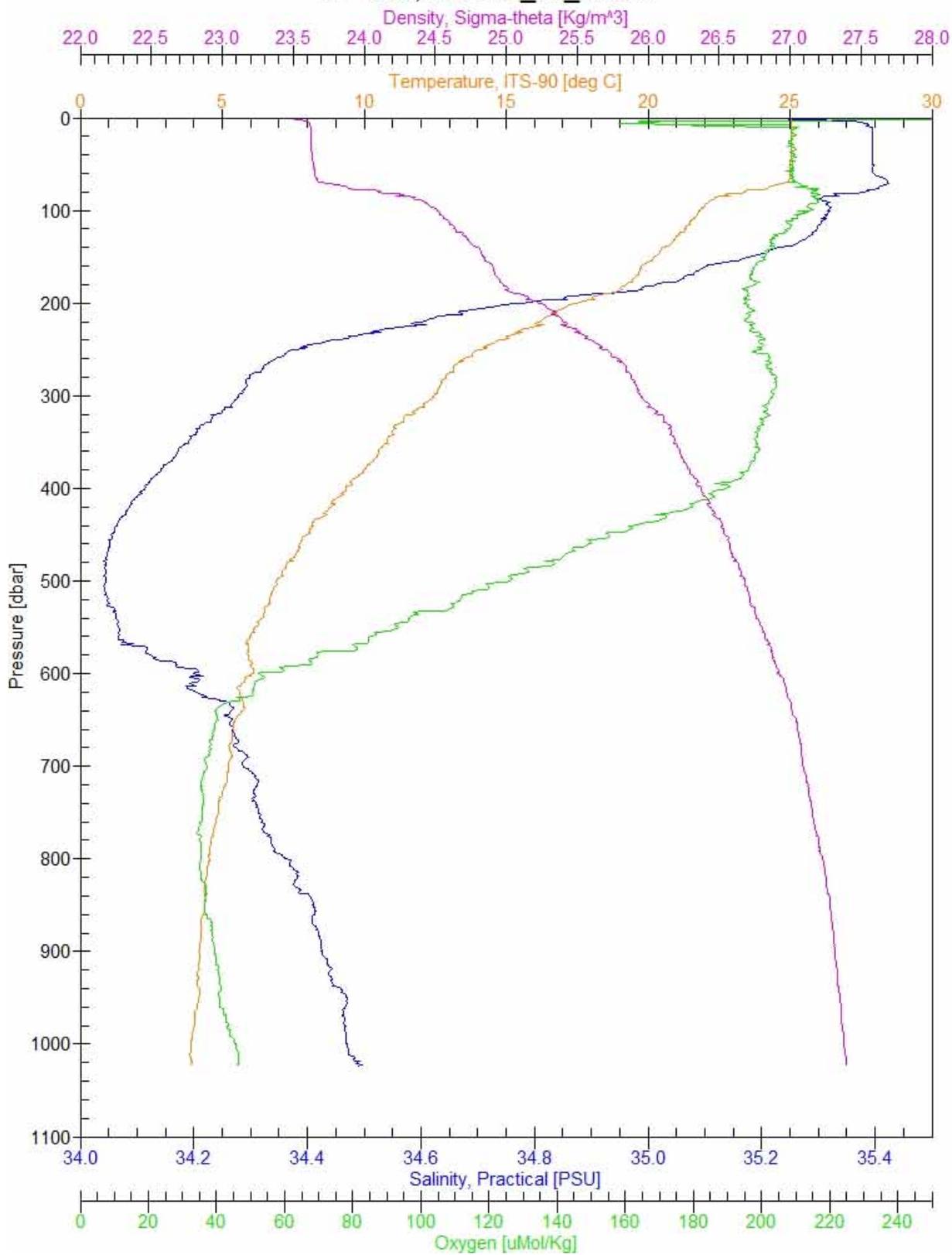
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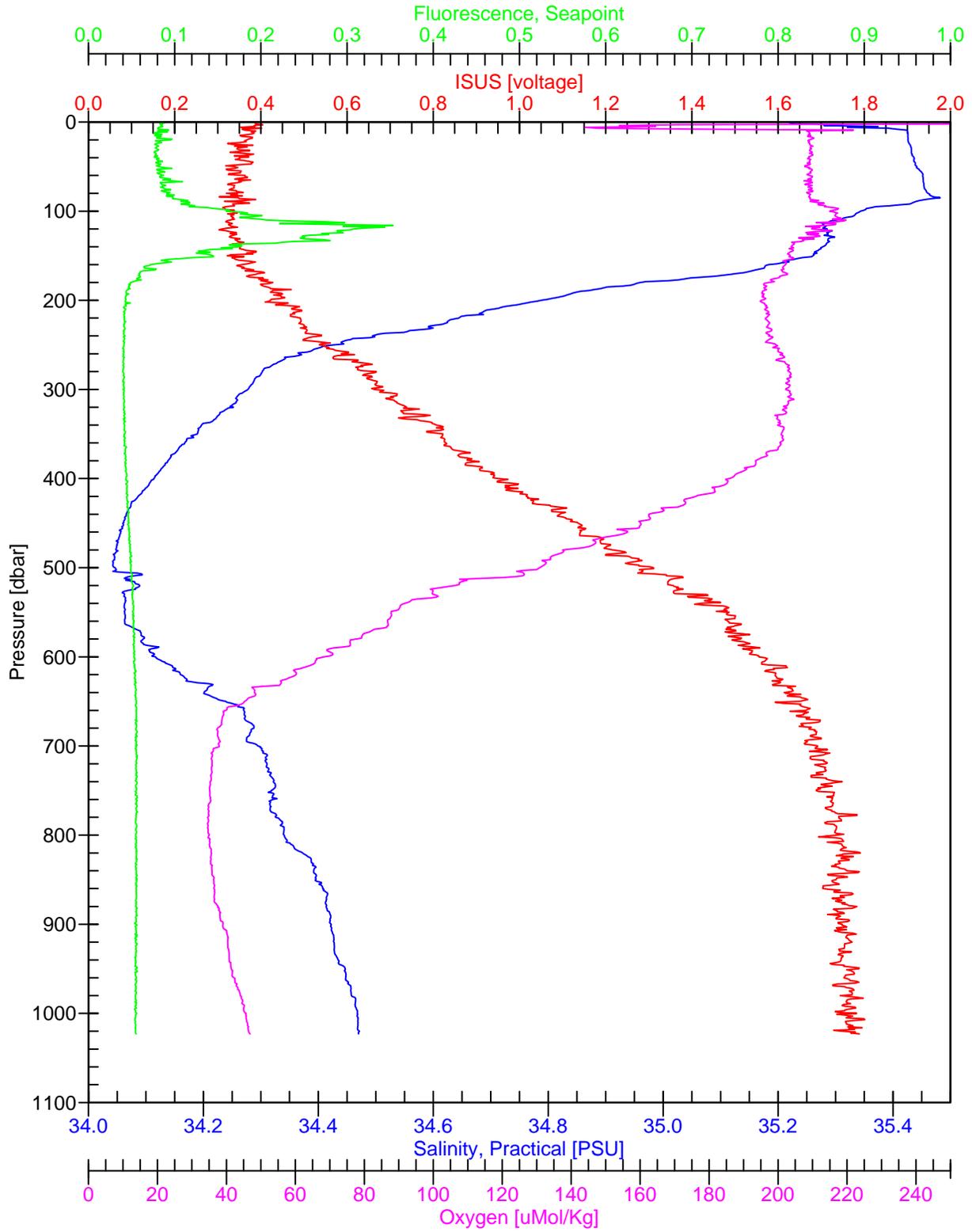
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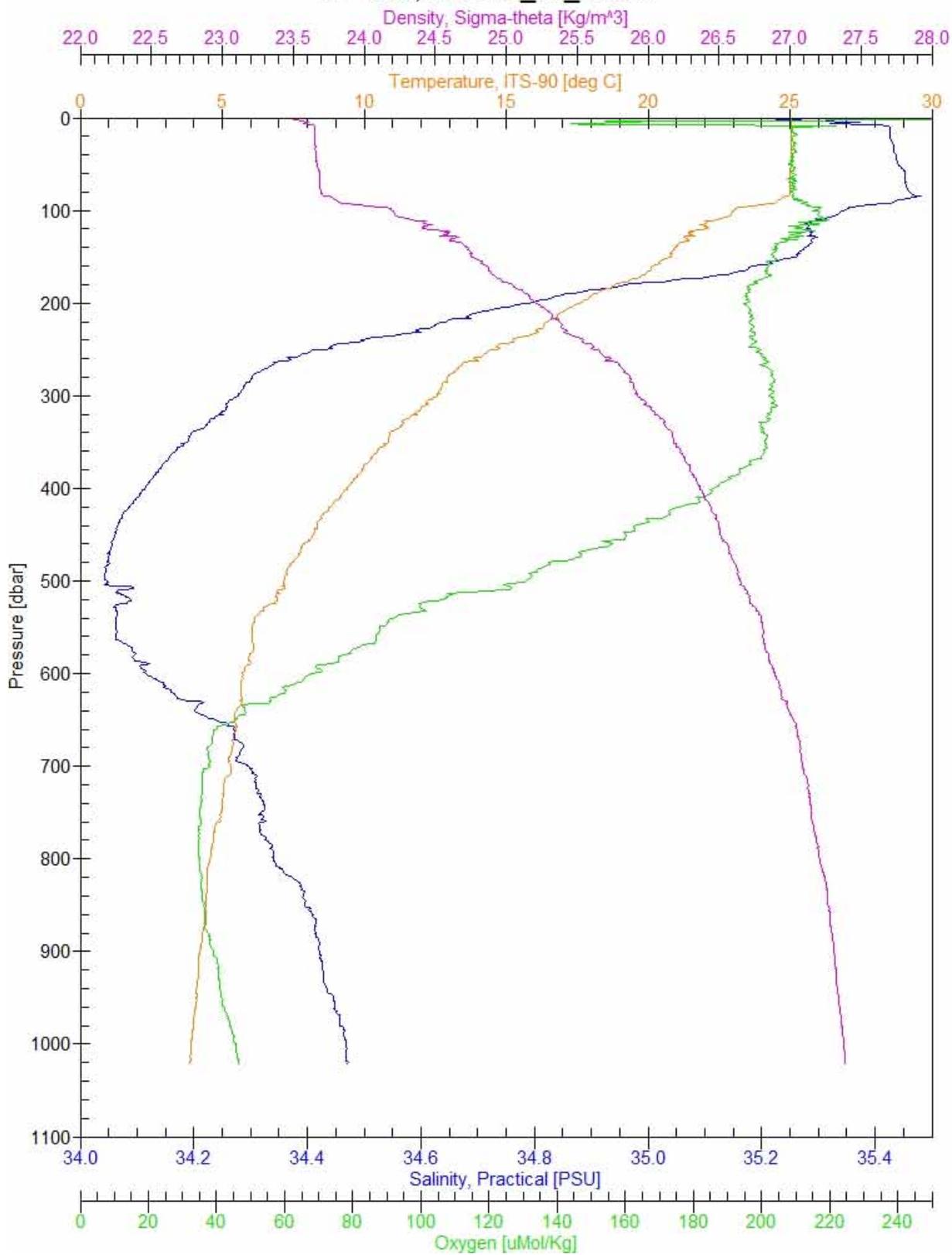
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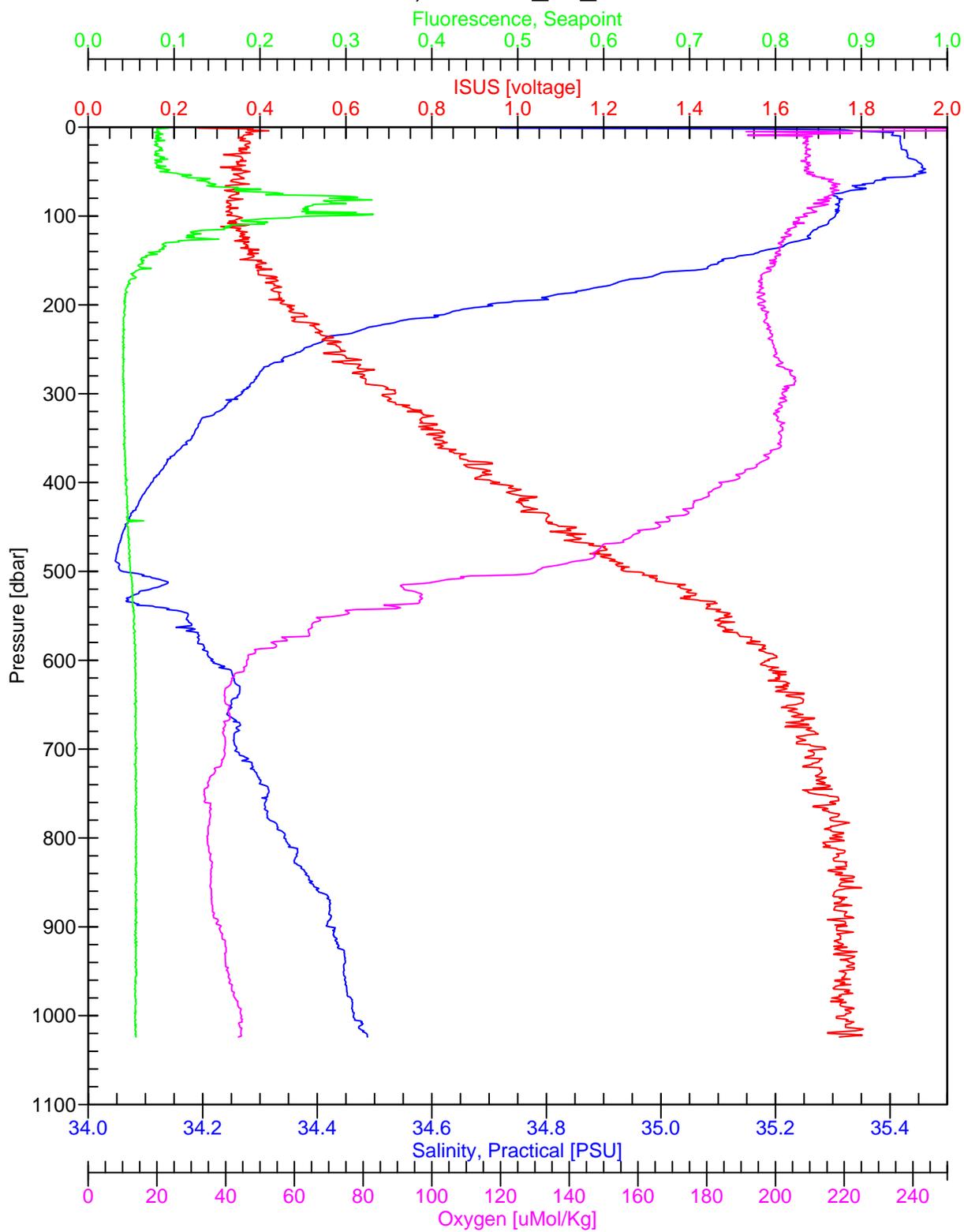
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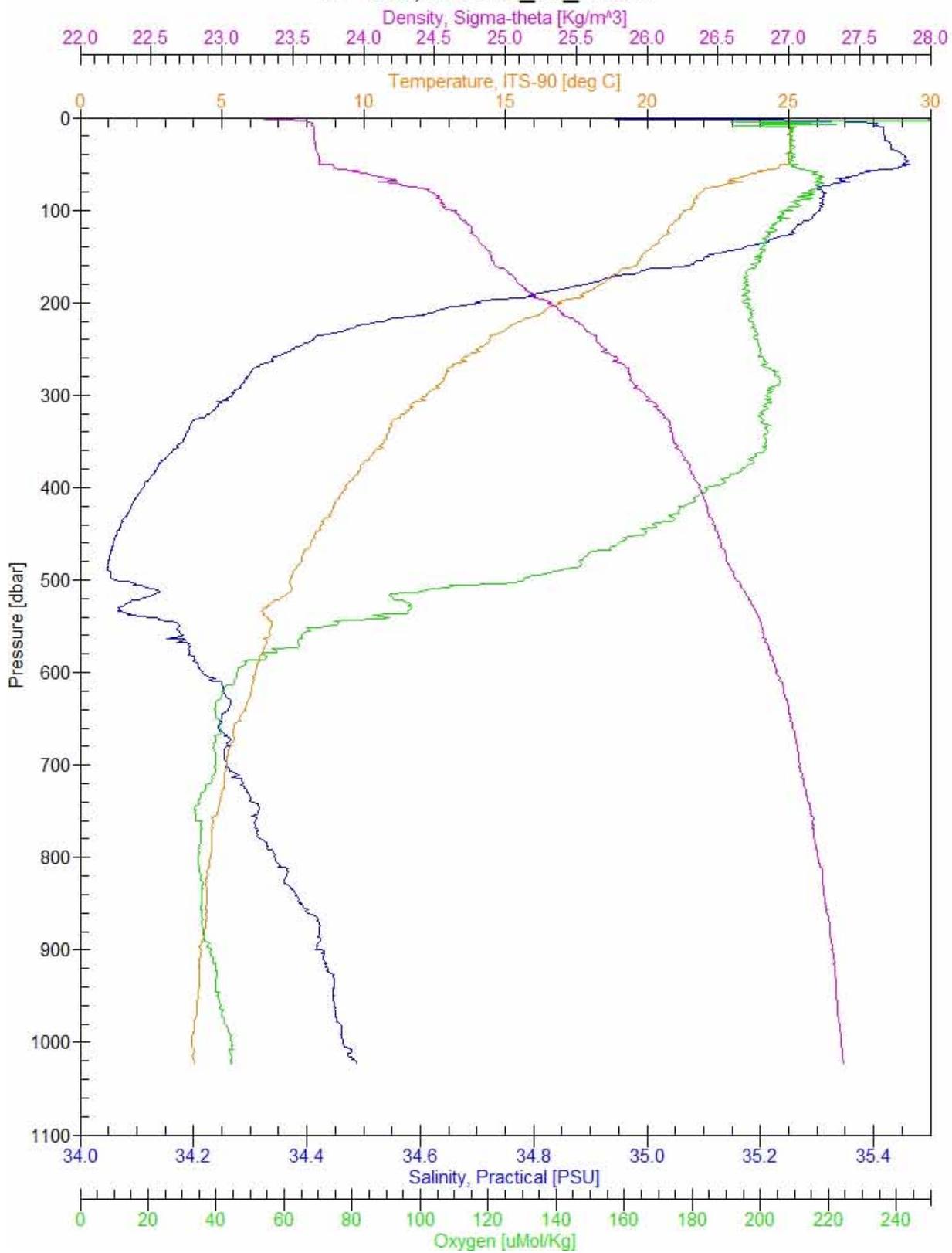
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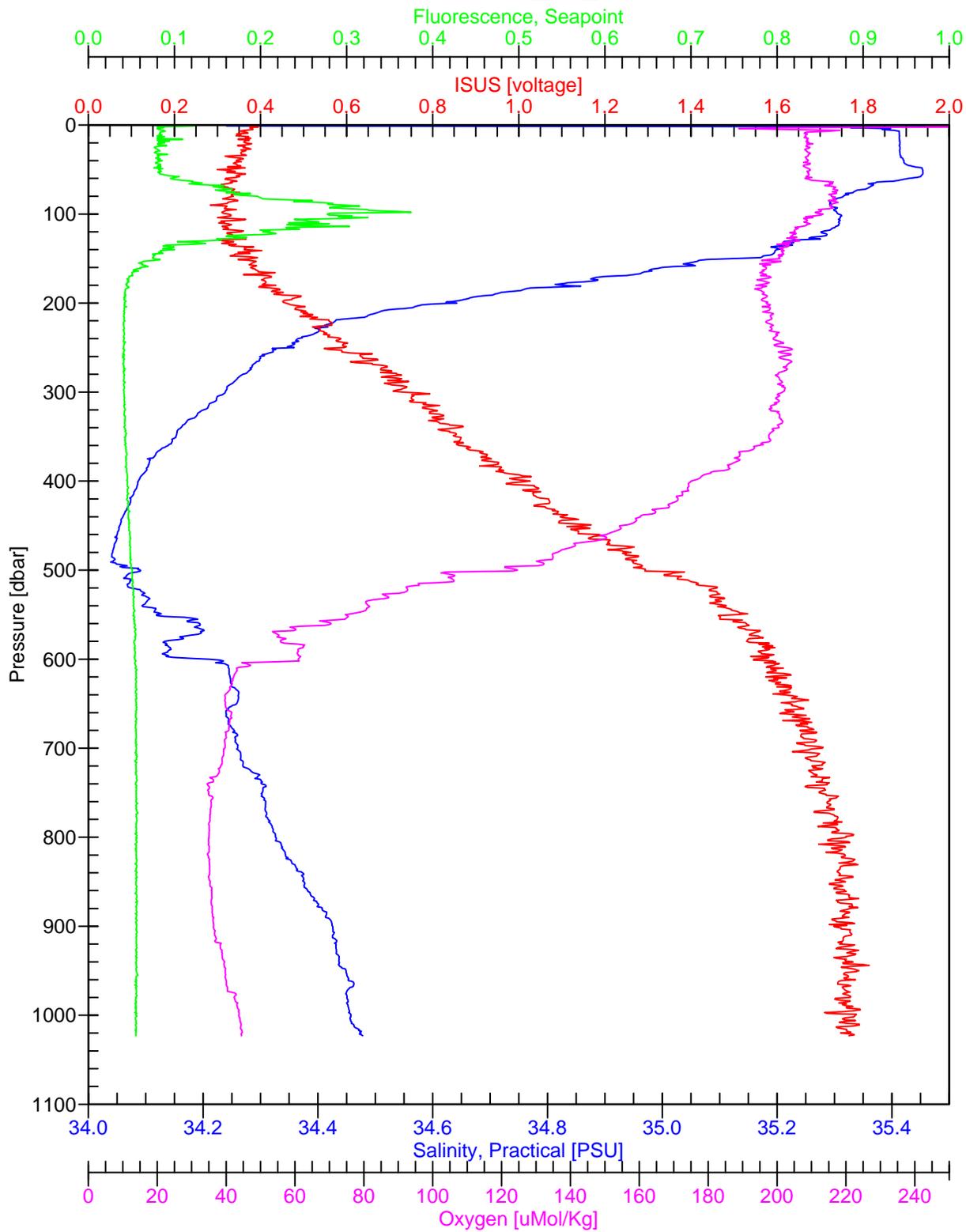
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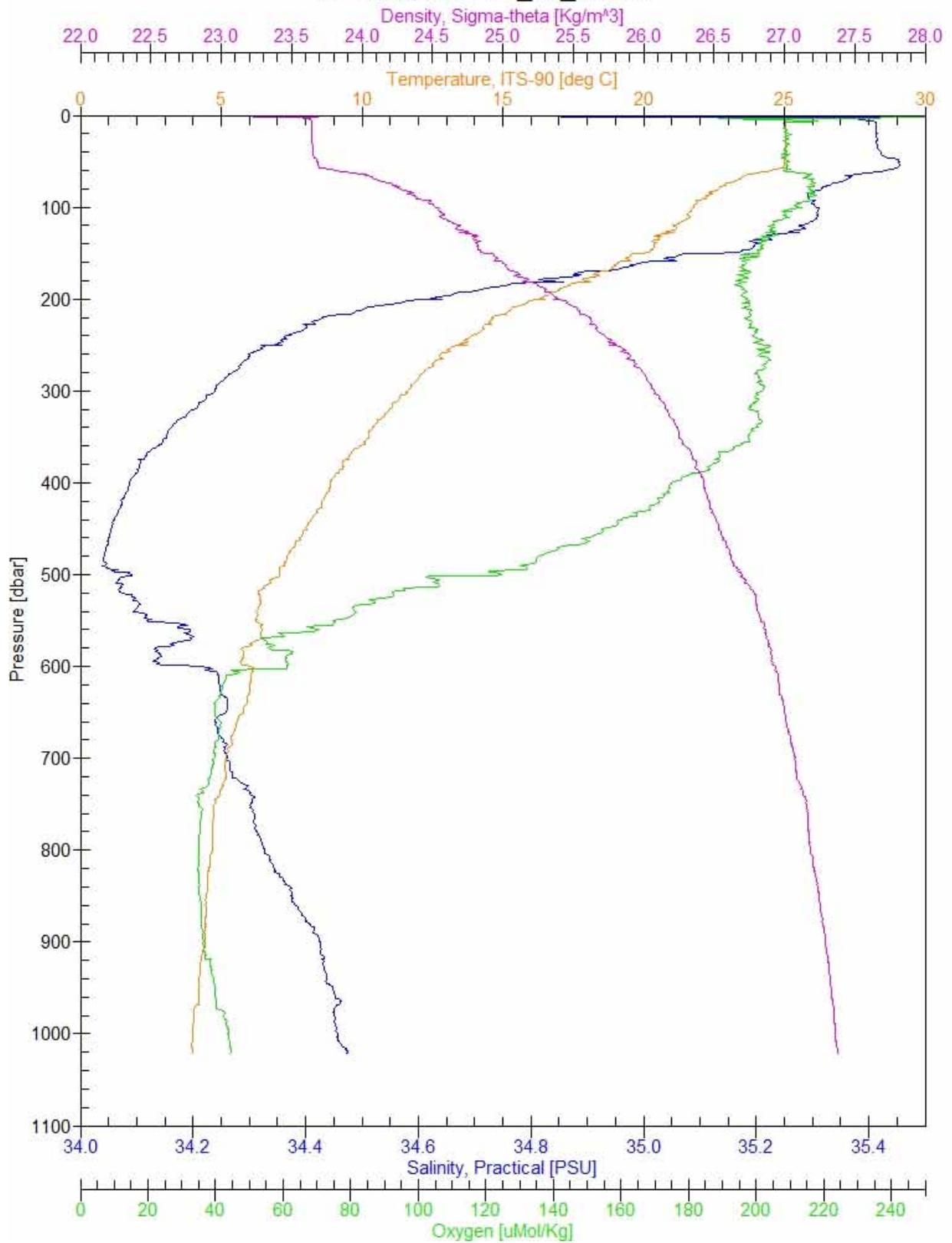
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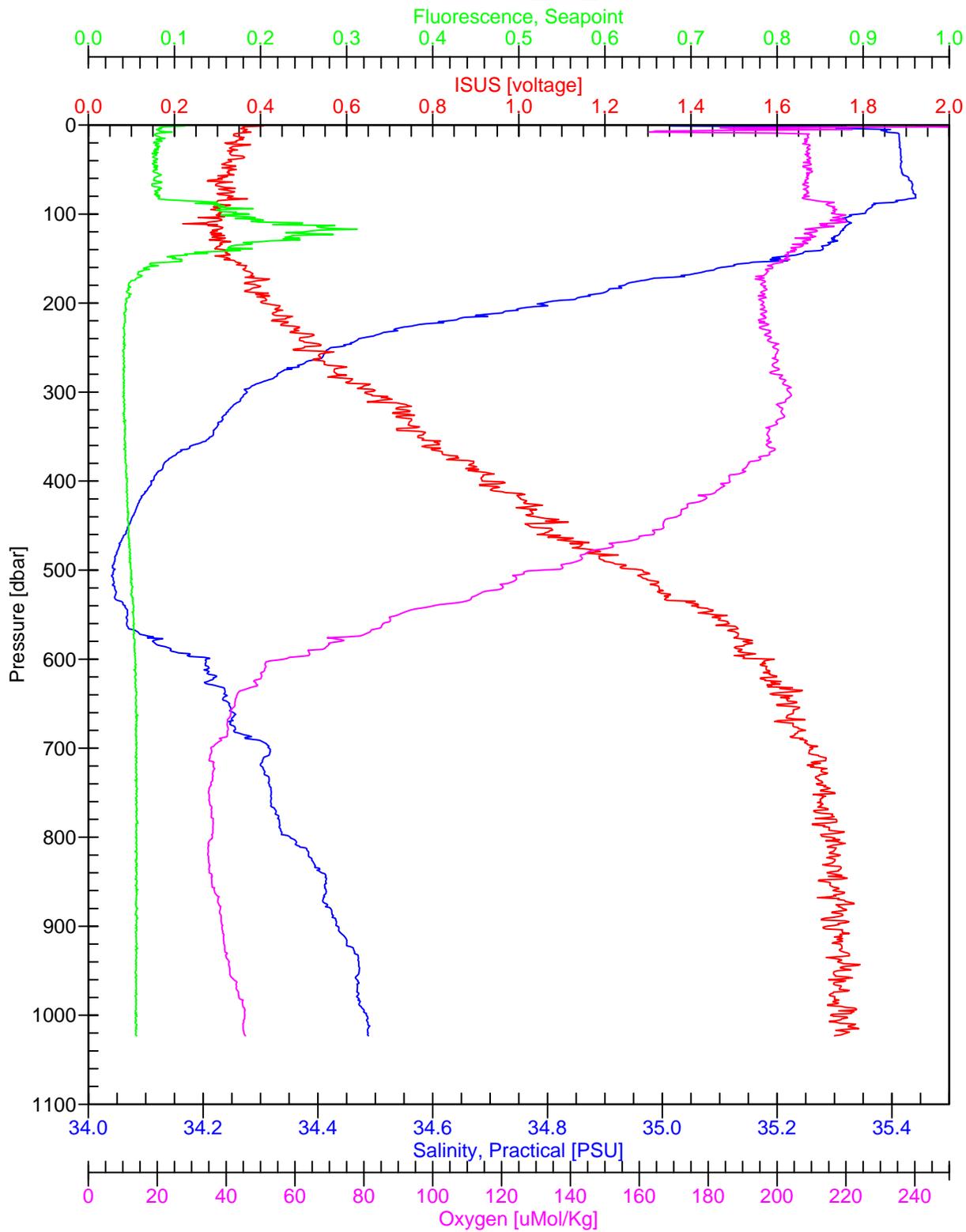
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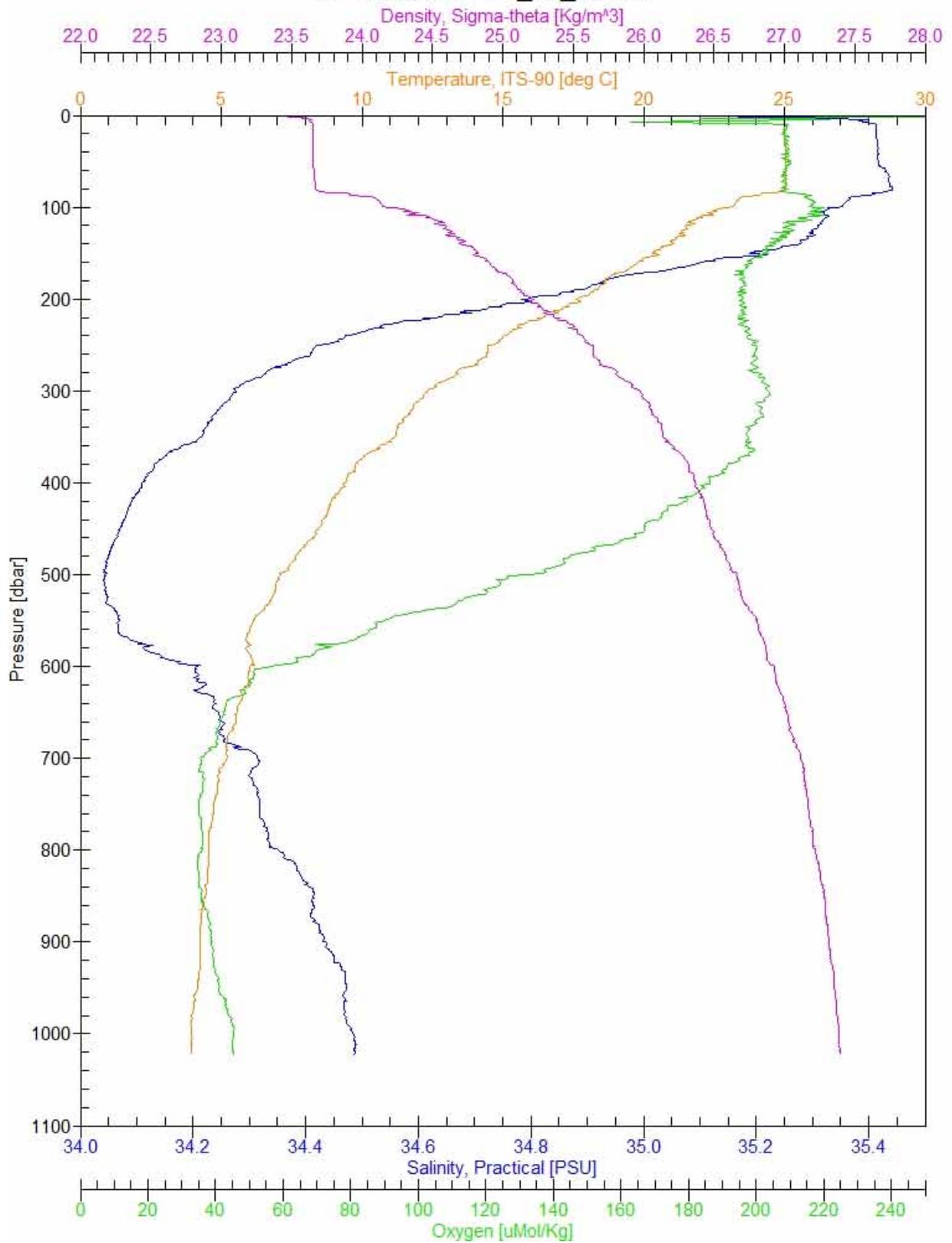
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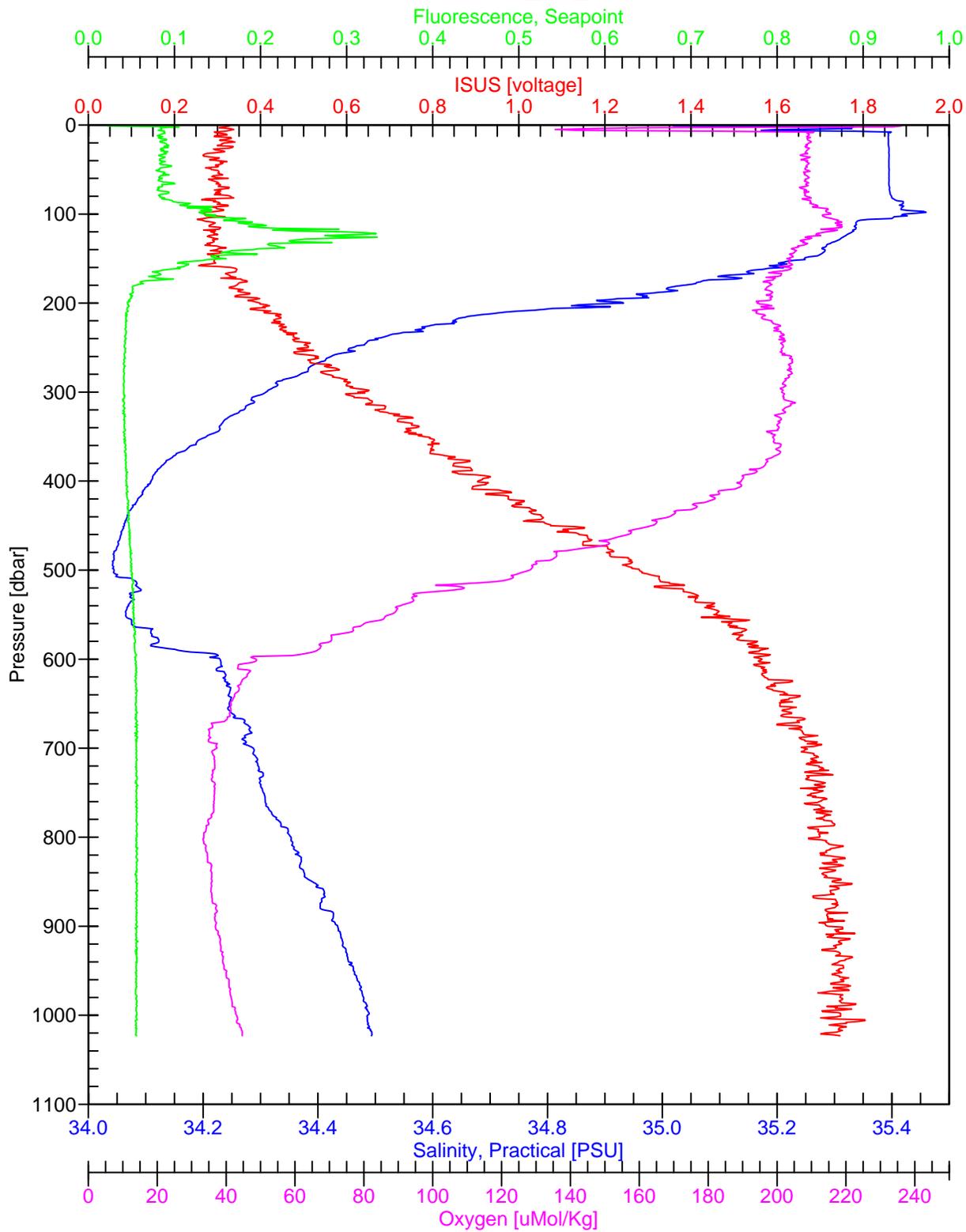
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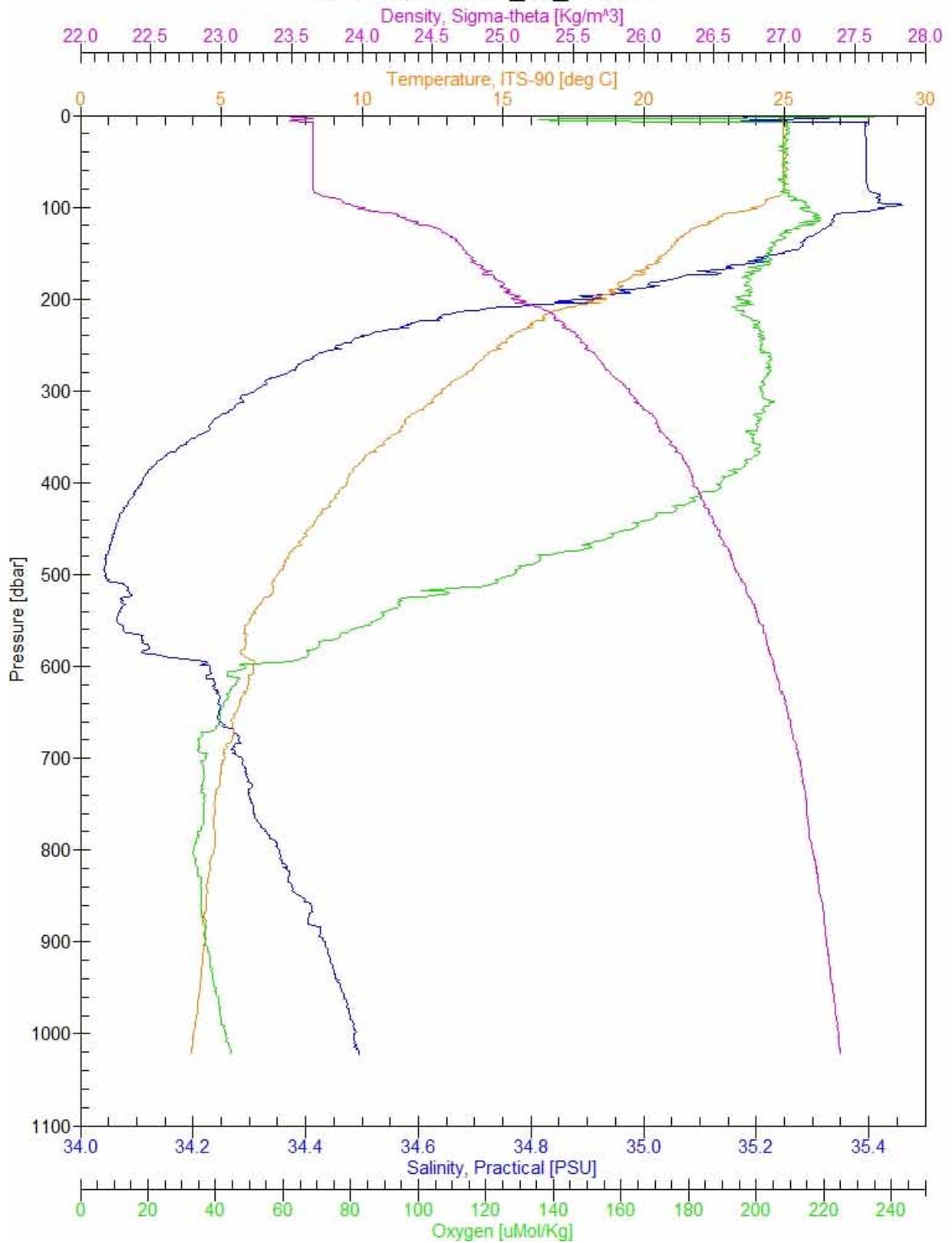
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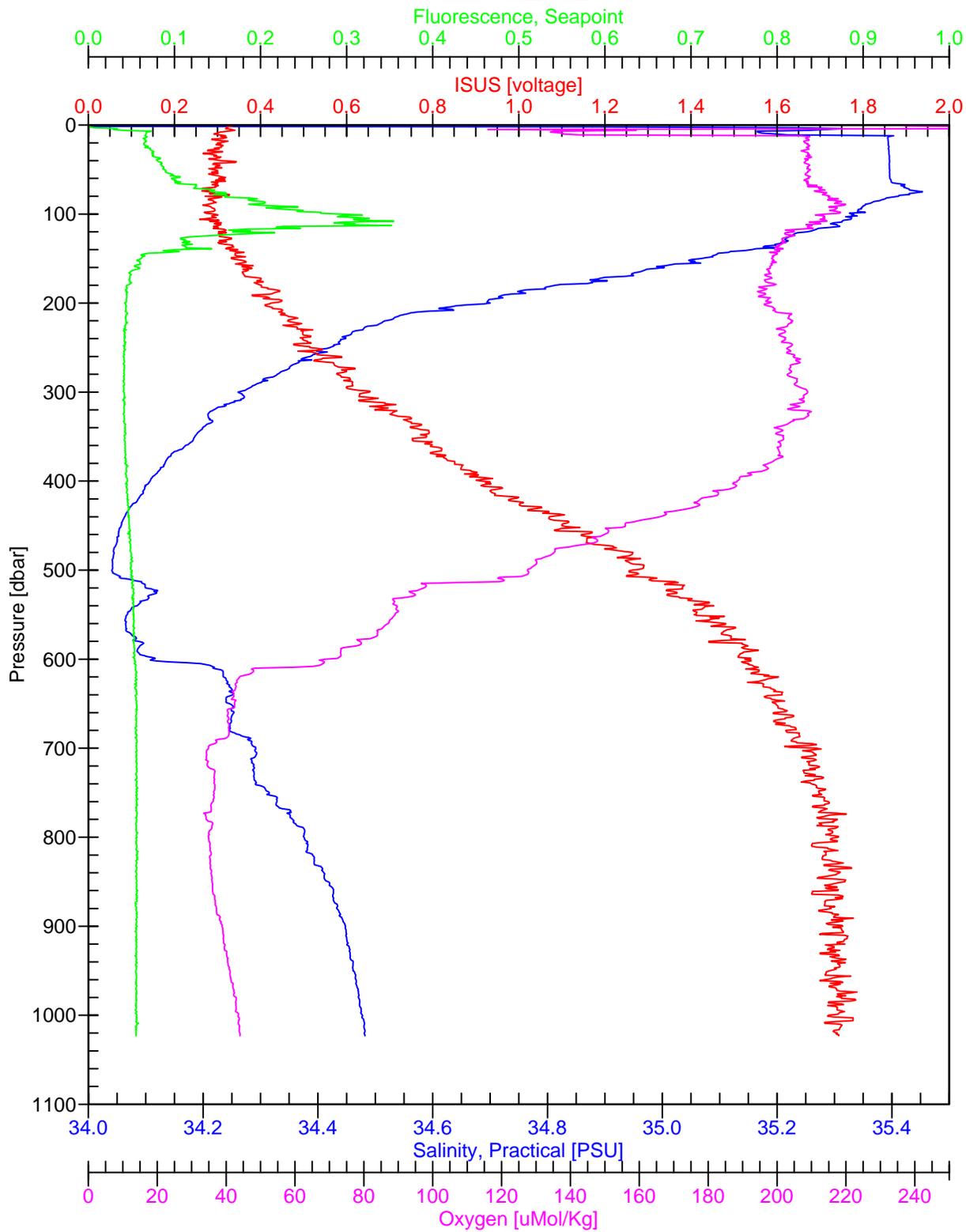
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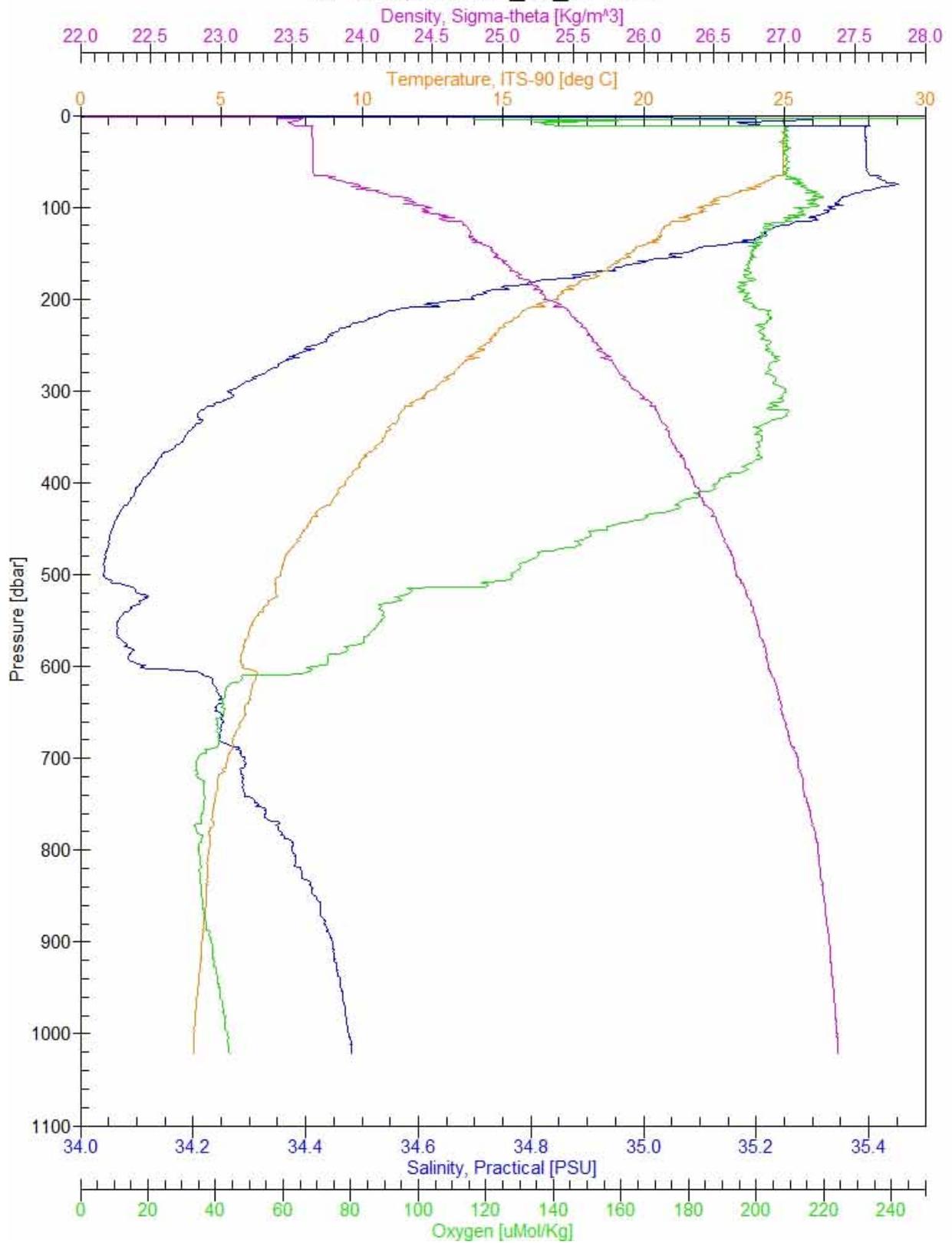
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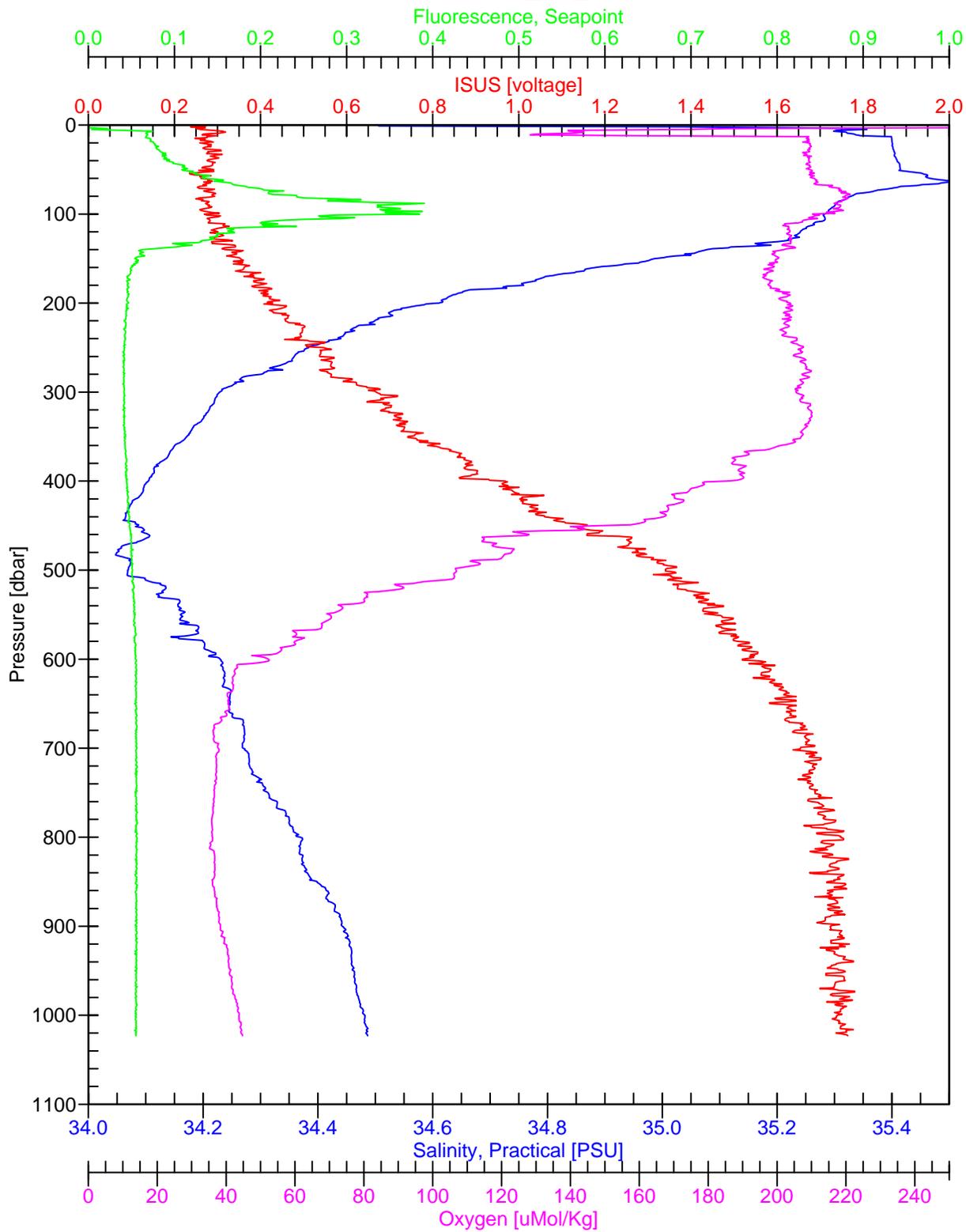
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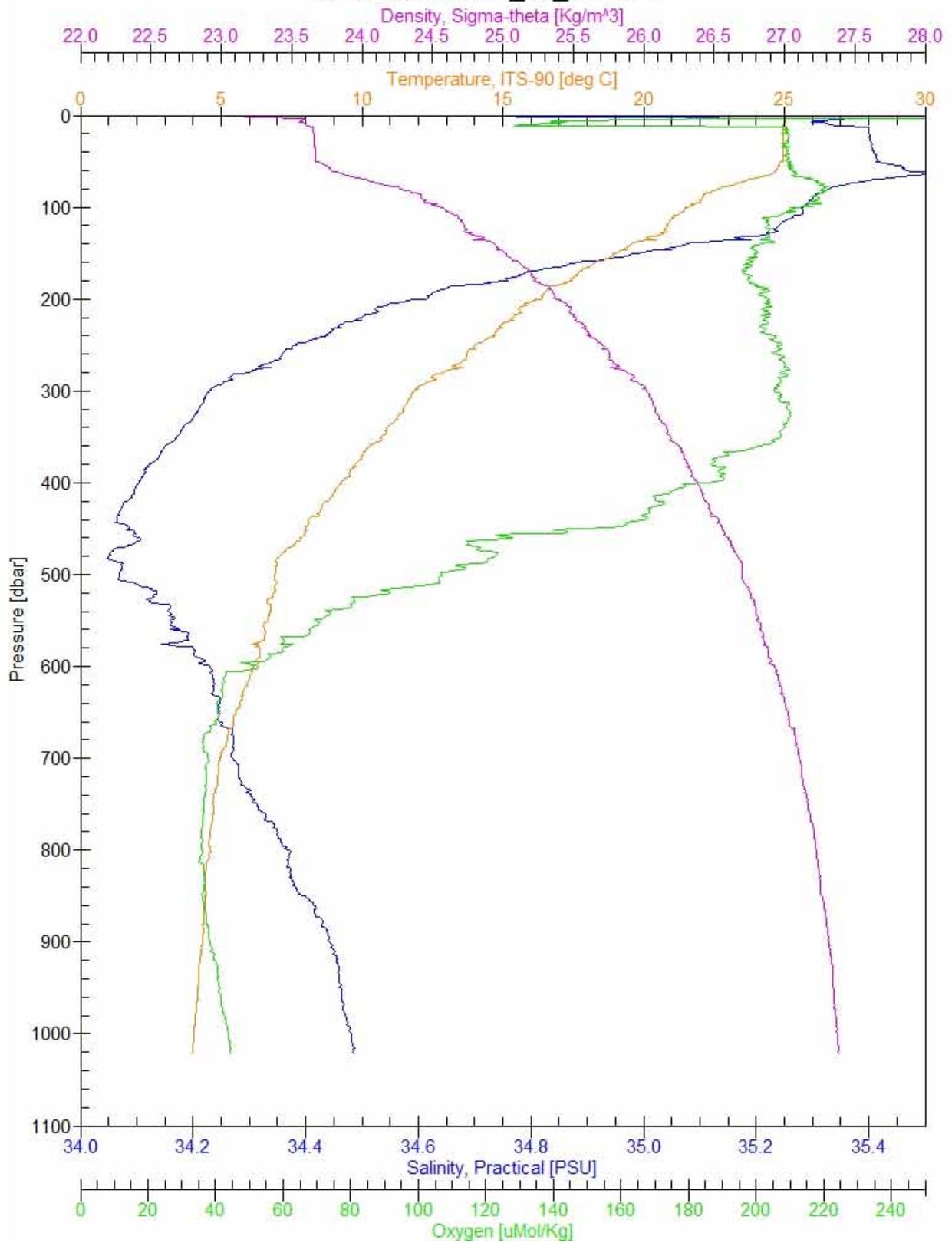
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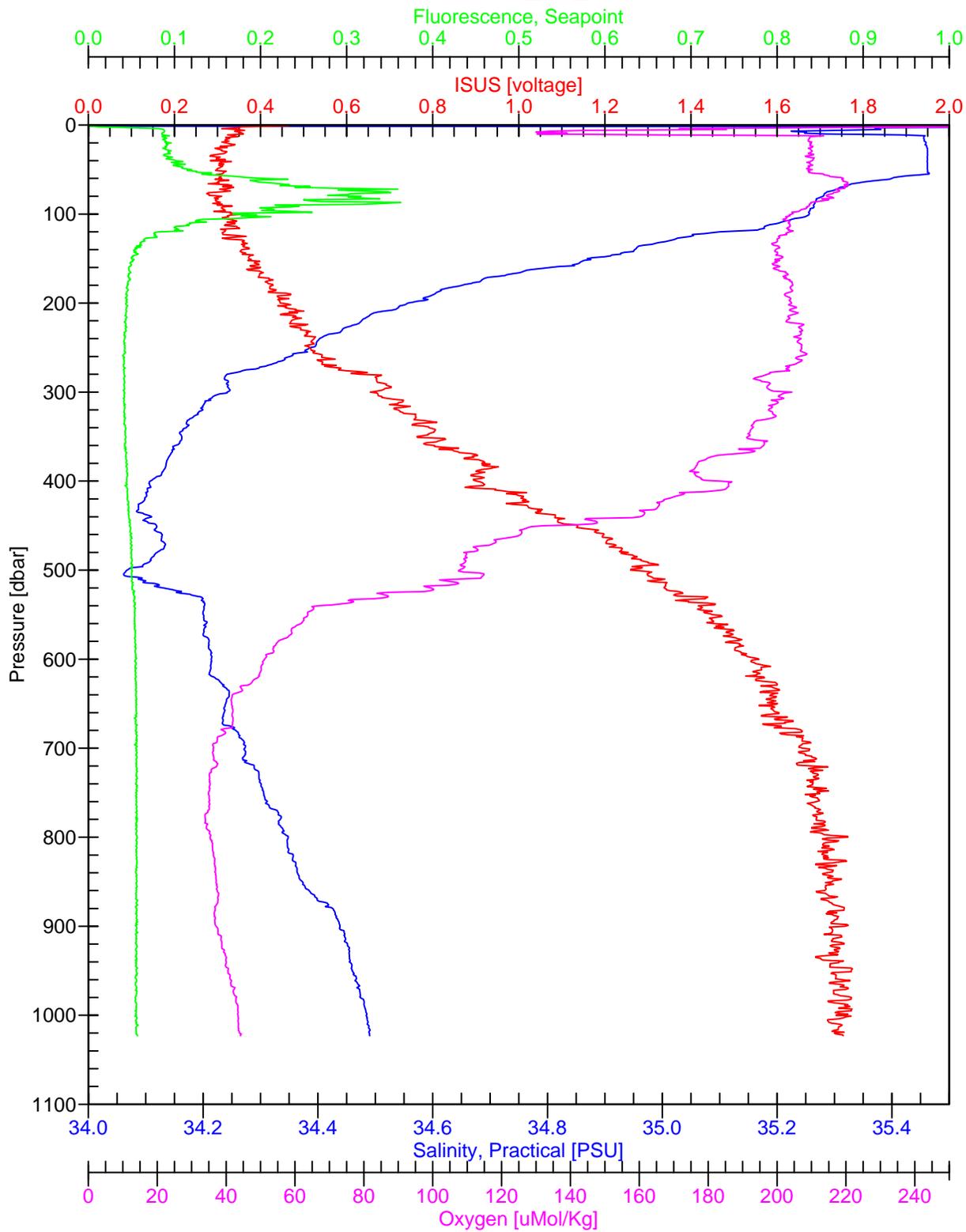
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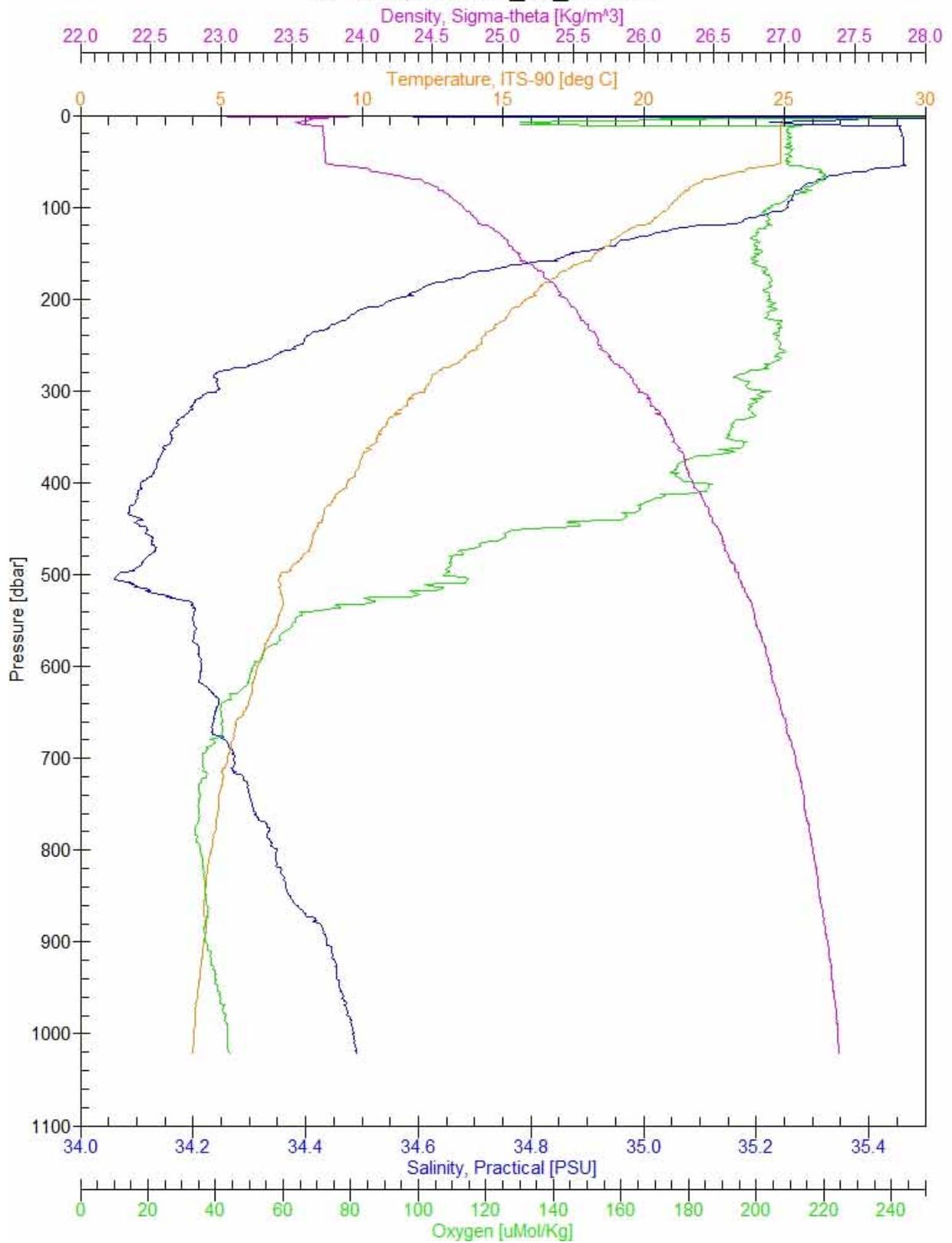
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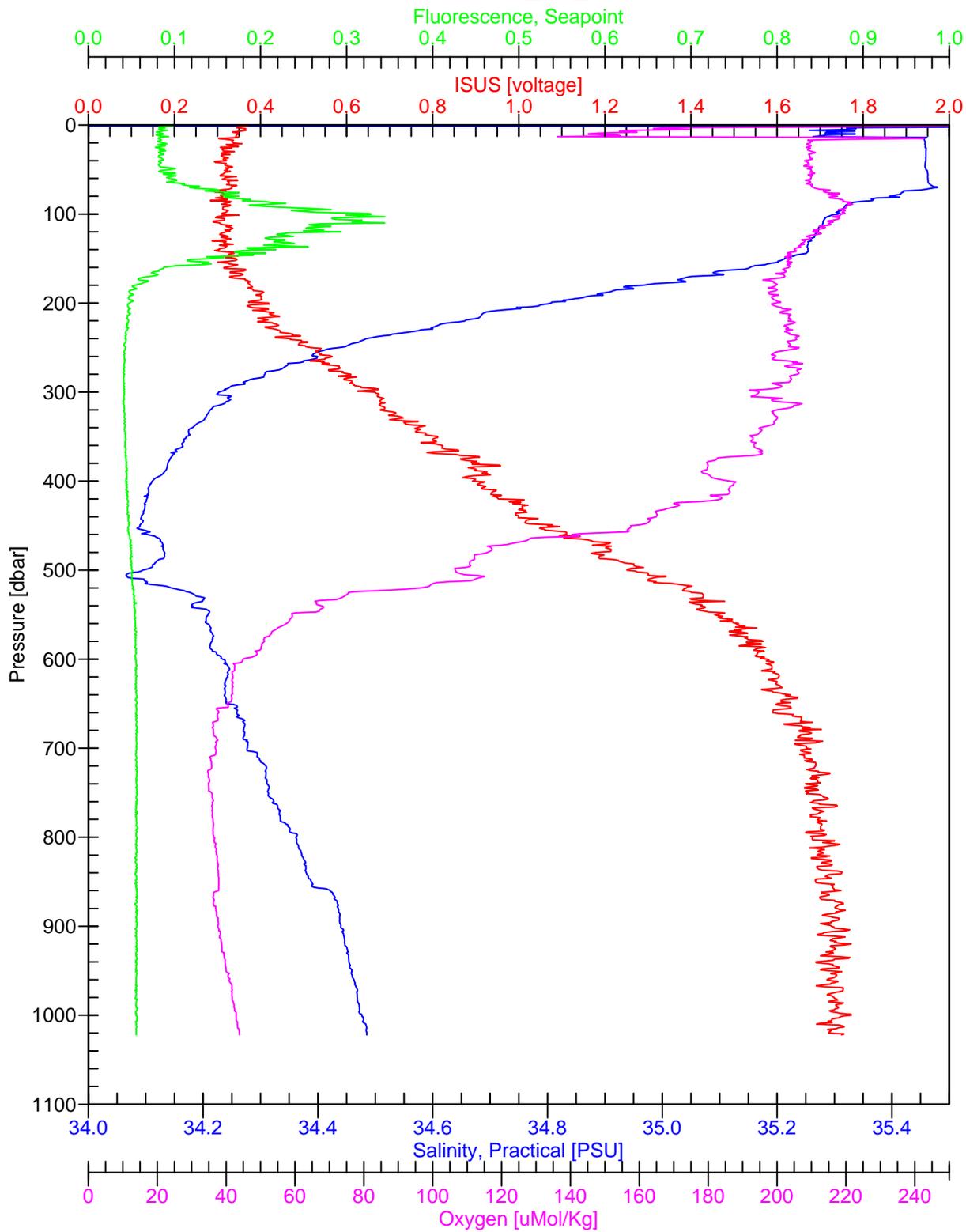
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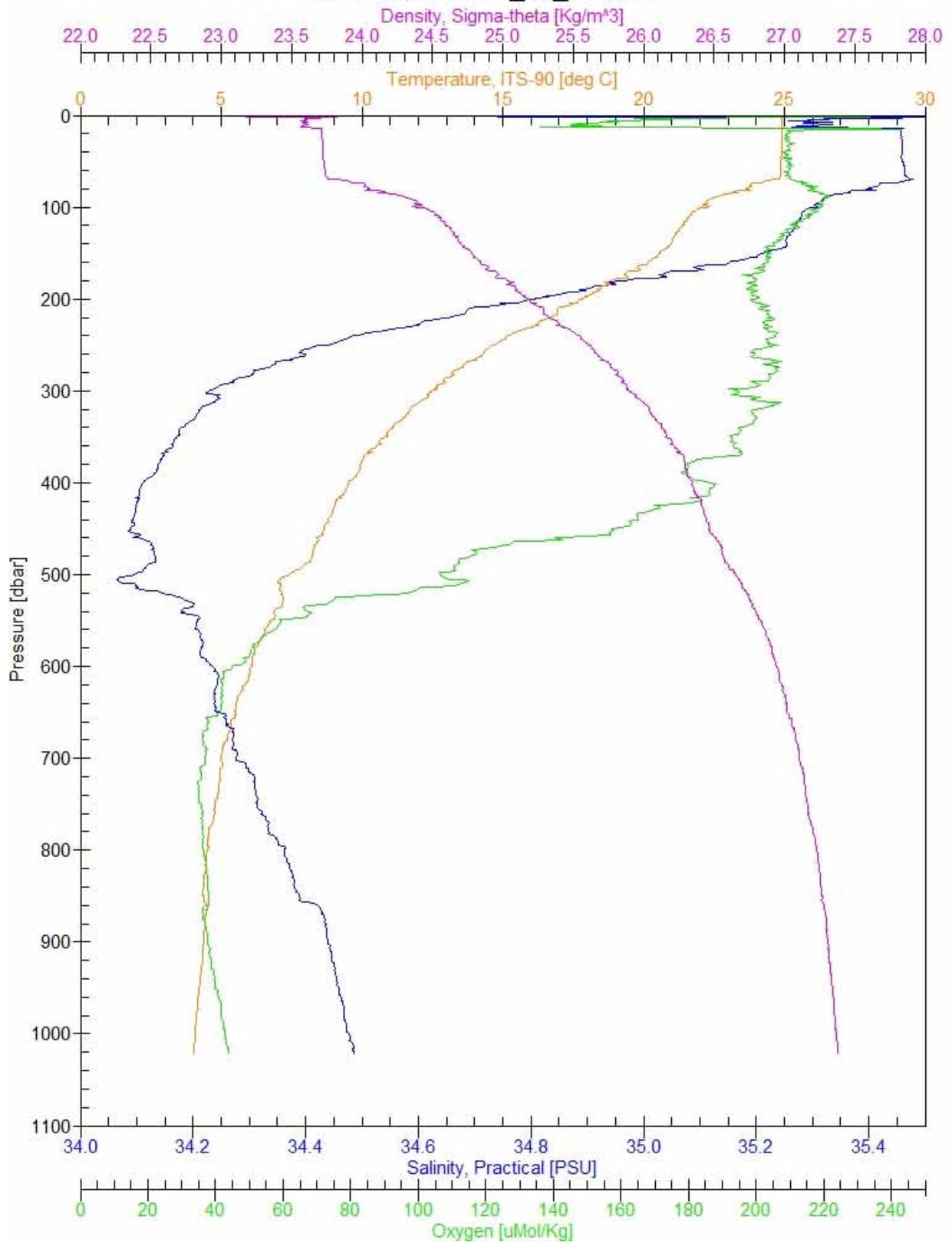
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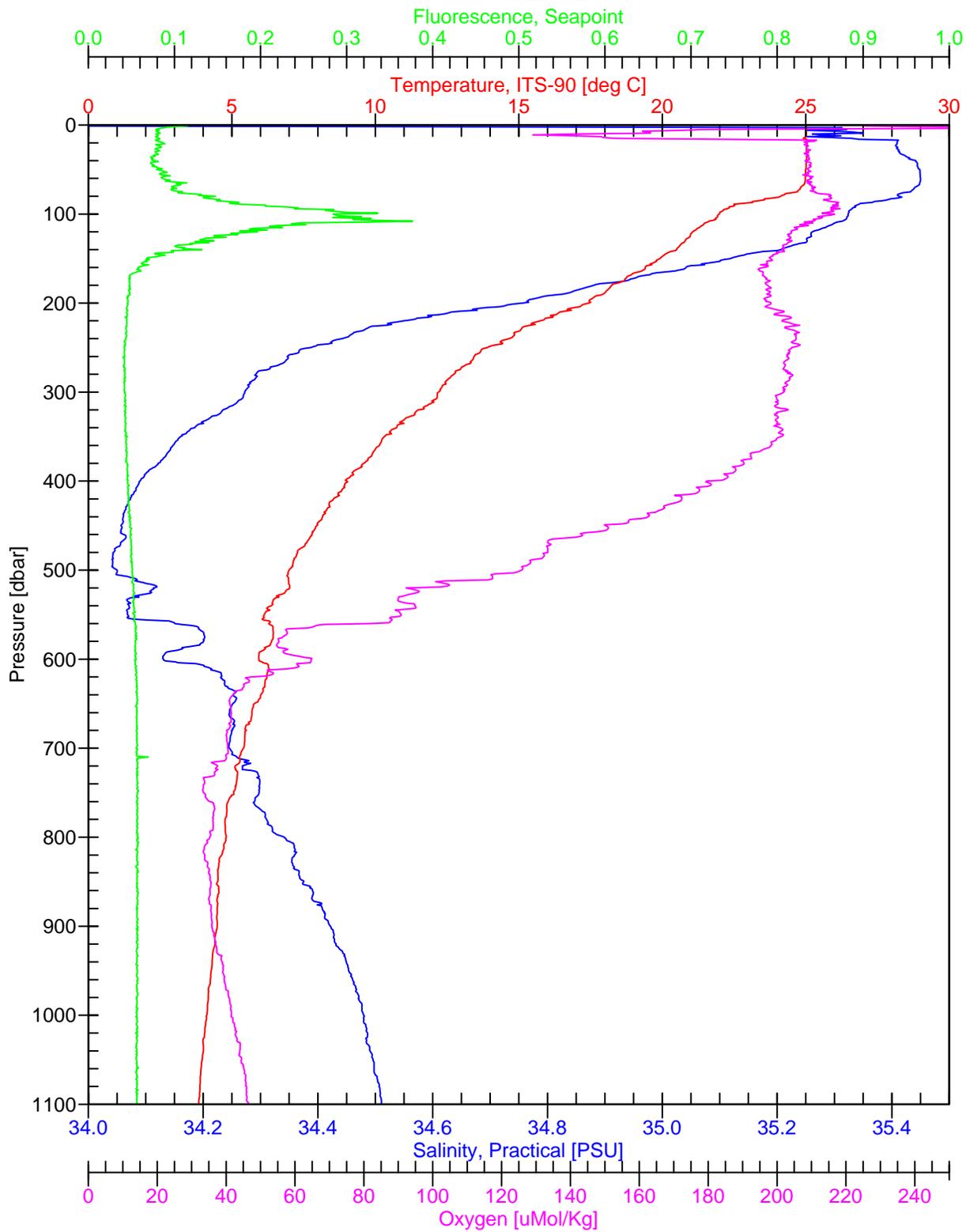
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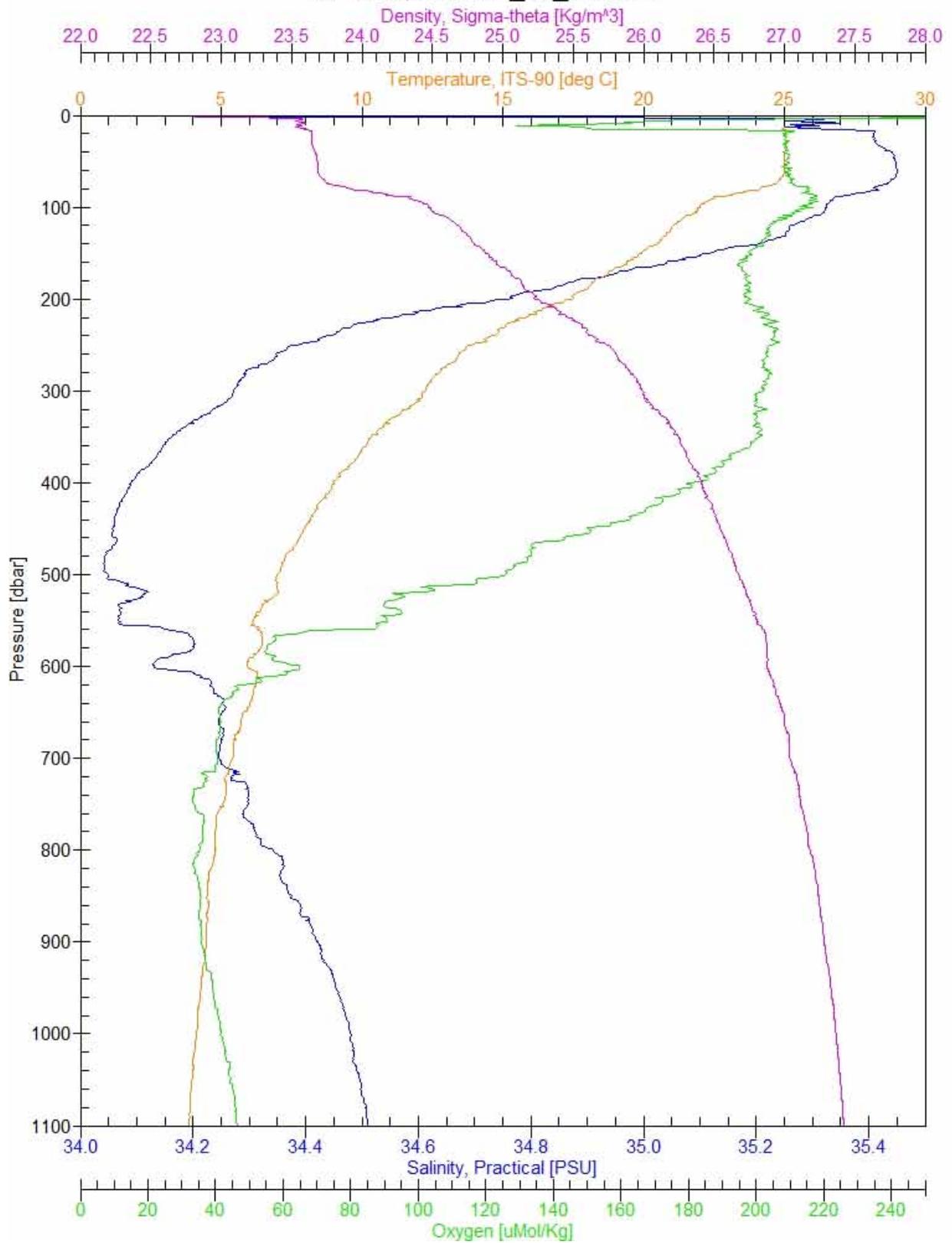
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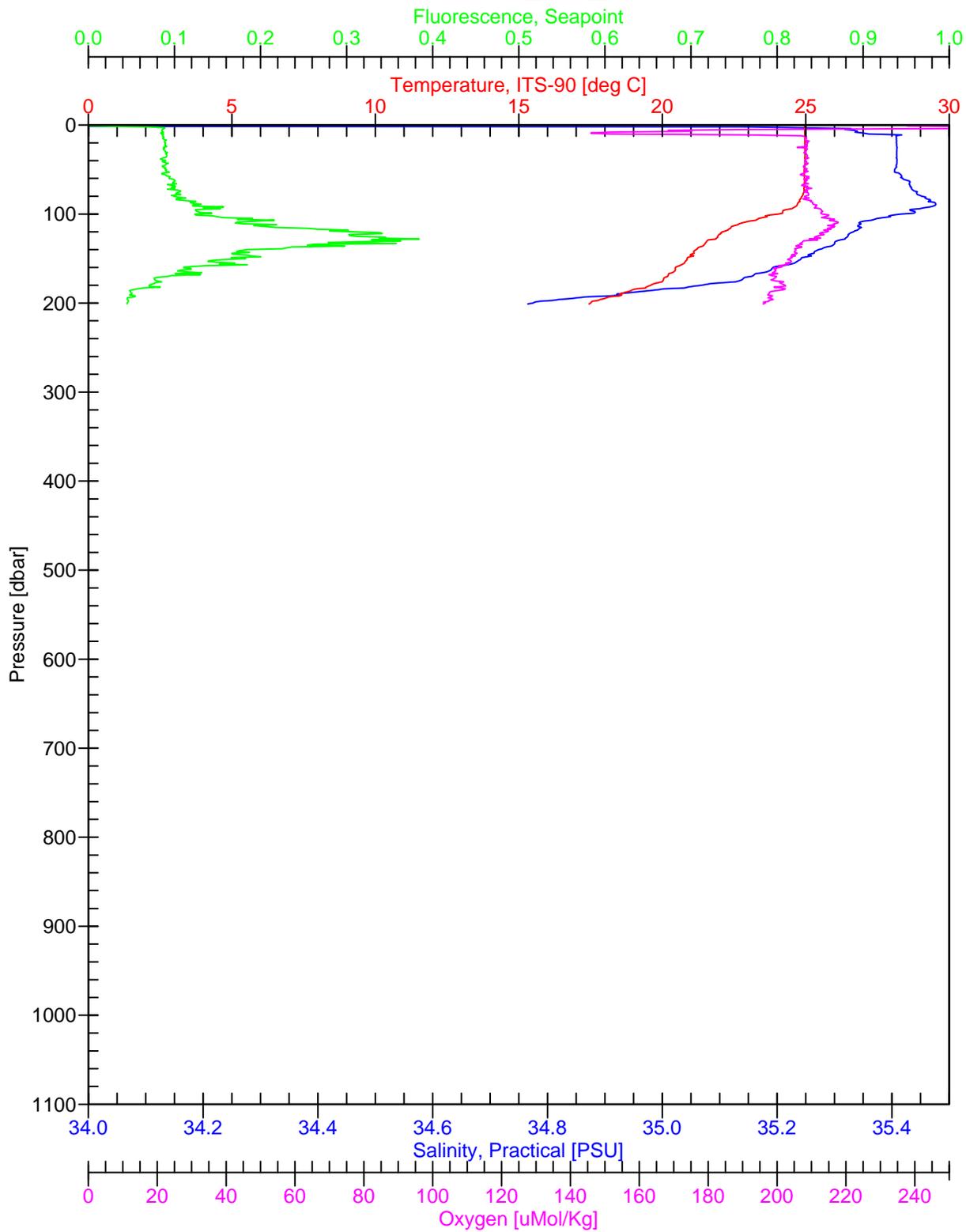
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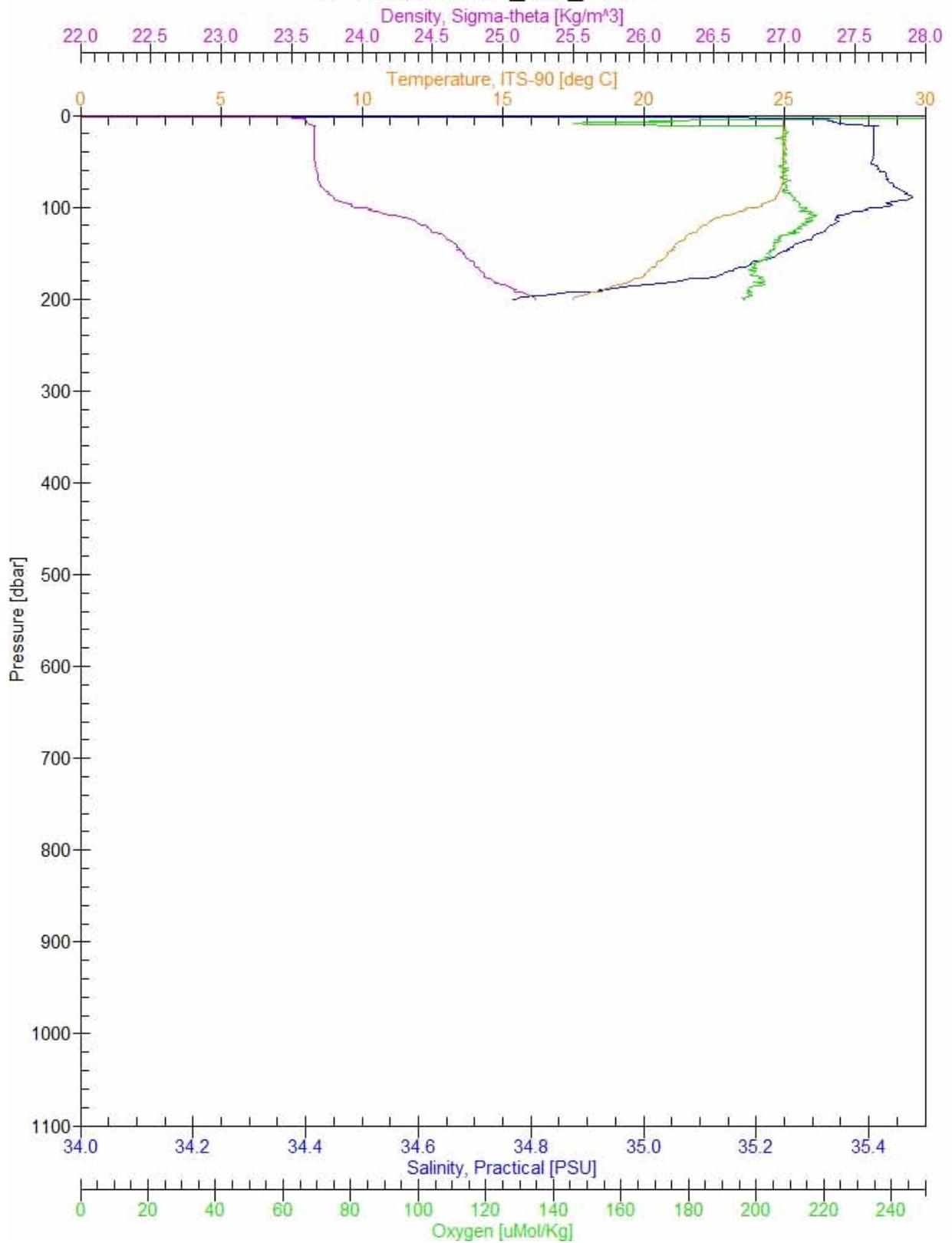
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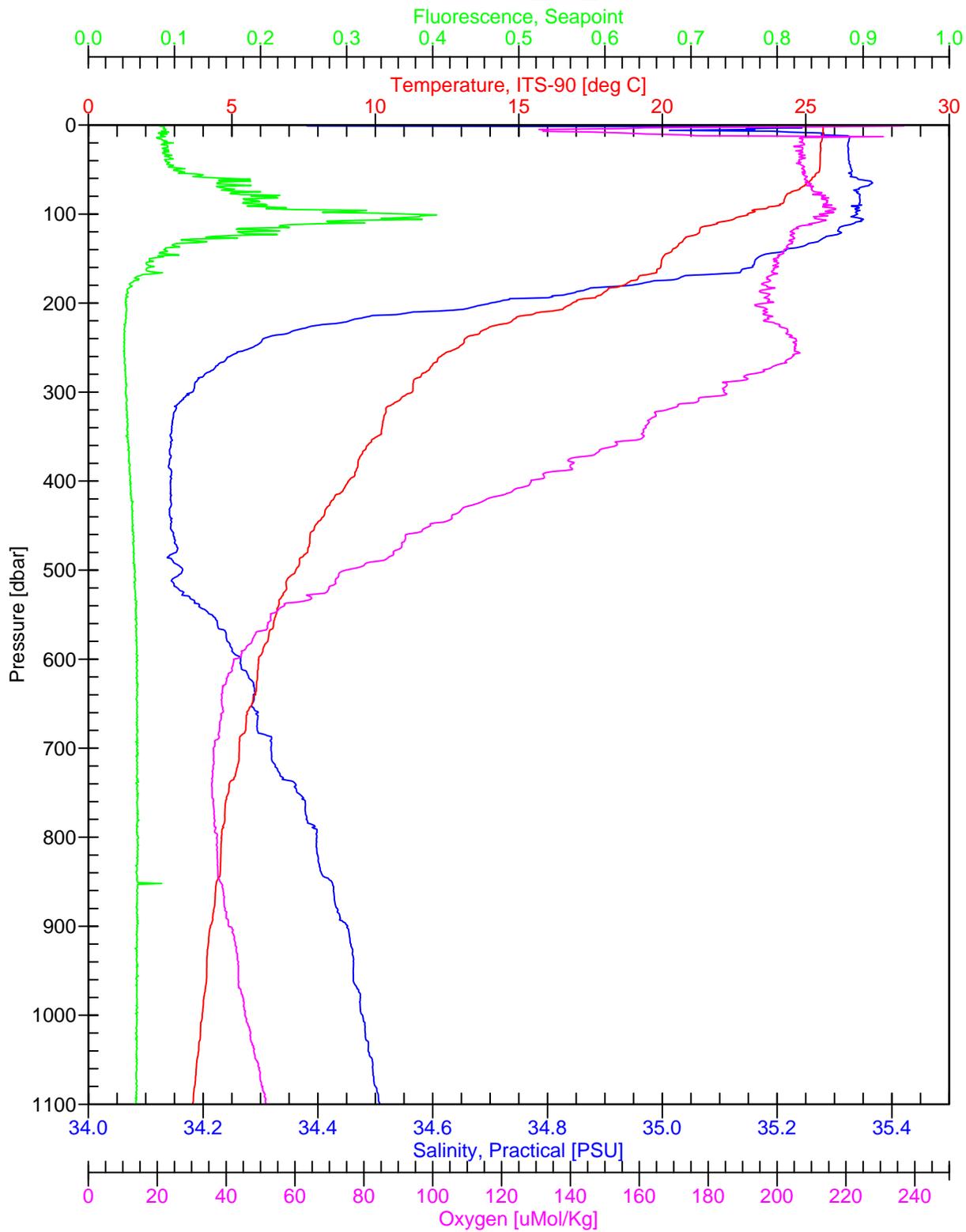
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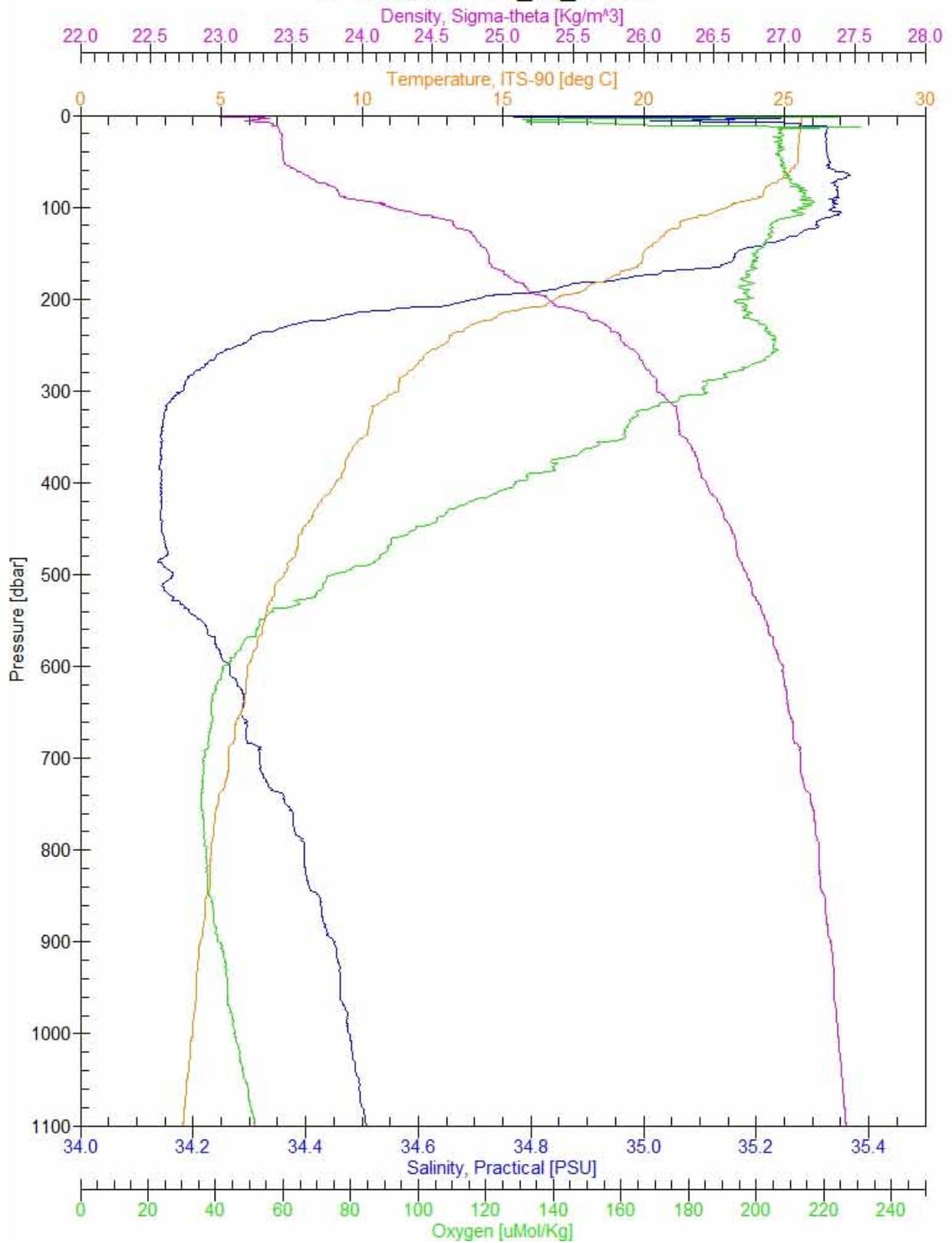
W-1000, hot-258_s52_c1.cnv



G-1000, hot-258_s6_c1.cnv



W-1000, hot-258_s6_c1.cnv



Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000 GPs	12L	26.11	DM

- Pinger
- Altimeter
- Transmissometer - OTG/B. Barone
- BEACH Sea Tech Fluorometer
- OTG Seapoint Fluorometer
- ISUS
- PO Fluorometer
- Sal min: 400 dbar
- mixed layer: 55 dbar

Station: 1	Cast: 1
Latitude start: 21 20.627 end: 21 20.620	Longitude start: 158 16.400 end: 158 16.430
Depth of water: 1574 meters	Date (GMT): 12 / 19 / 13
Pressure on Deck	Time:
Begin: -0.42 End: -0.42	Start Log: 22 54 In Water: 22 59 Out of Water: 12/20/13
Max cast pressure: 1020 dbar	0011

Trip/ Niskin	Time	Confirm	Pressure	Target Depth	Comments
	stopped	tripped			
1	23:30:40	23:31:10	1019	1020	
2	34:10	34:30	900	[900]	
3		:40	901	[900]	
4	38:00	38:20	750	750	
5	40:00	40:20	700	700	
6	42:40	43:00	599	600	
7	45:20	45:40	499	500	
8	48:00	48:20	400	400	
9	49:50	50:10	349	350	
10	51:30	51:50	300	300	
11	53:20	53:40	249	250	
12	54:40	55:00	224	225	
13	56:20	56:40	199	200	
14	57:20	57:40	175	175	
15	58:50	59:10	150	150	
16	00:00:10	00:00:30	124	125	
17	01:20	01:40	115	115	
18	02:20	02:40	100	100	
19	03:30	03:50	74	75	
20	04:40	05:00	61	60	
21	06:00	06:20	45	45	
22	07:20	07:40	25	25	
23	09:30	09:50	6	[5]	
24		10:00	6	[5]	

Hawaii Ocean Time Series			Station #: 1	Cast #: 1	Box #: 2
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS/DR	
Niskin #	Depth	Serial #	Comments		
1	1020	25			
2	900	26			
3	900	27			
4	750	28			
5	700	29			
6	600	30			
7	500	31			
8	400	32			
9	350	33			
10	300	34			
11	250	35			
12	225	36			
13	200	37			
14	175	38			
15	150	39			
16	125	40			
17	115	41			
18	100	42			
19	75	43			
20	60	44			
21	45	45			
22	25	46			
23	5	47			
24	5	48			

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000 GIPS	12L	24.89	CF/DM

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer

mixed to: 50
 sal min: 500

Station: 2	Cast: 1
Latitude start: 22 45.019 end: 22 45.011	Longitude start: 158 2.066 end: 158 2.077
Depth of water: 475 meters	Date (GMT): 12 / 20 / 13
Pressure on Deck	Time:
Begin: -0.47 End: -0.43	Start Log: 11:50 In Water: 12:01 Out of Water: 13:11
Max cast pressure: 1024 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	12:34:10	12:34:40	1021	1020	
2	45:40	46:10	500	500	sal min
3	53:20	53:50	173	175	
4	55:30	56:00	149	150	
5	57:40	58:10	125	125	
6		20	126	125	
7		:30	126	125	
8	59:50	13 00:30	100	100	
9		:30	101	100	
10		:40	100	100	
11	13:02:10	13 02:40	73	75	
12		:50	72	75	
13		03:00	73	75	
14	05:00	05:30	44	45	
15		:40	44	45	
16		:50	45	45	
17	07:10	07:40	27	25	
18		:50	25	25	
19		08:00	22	25	
20	09:40	10:10	7	5	
21		20	7	5	
22		30	7	5	
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G5000GPS	12L	24.88	DM

Station: 2	Cast: 2
Latitude start: 22 45.009 end: 22 45.003	Longitude start: 157 59.971 end: 158 0.000
Depth of water: 4742 meters	Date (GMT): 12 / 20 / 2013
Pressure on Deck	Time:
Begin: -0.44 End: -0.46	Start Log: 1501 In Water: 1504 Out of Water: 1855
Max cast pressure: 4806 dbar	

- Pinger
- Altimeter
- Transmissometer
- BEACH Sea Tech Fluorometer
- OTG Seapoint Fluorometer
- ISUS - Removed
- PO Fluorometer
- sal min: 500

dbar	altimeter
4750	60
4790	23
4800	15
4805	

mixed: 75

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1		16:58:10	4805	4800	① 4500 - 4700 - 4750
2	17:05:40	17:06:10	4597	4600	
3	09:10	09:40	4501	4500	
4	11:56	12:20	4401	4400	10m off @ 22°45.053 157°59.979
5	16:15	16:45	4197	4200	
6	21:40	22:10	3998	4000	
7	27:00	27:30	3800	3800	
8	31:45	32:15	3601	3600	
9	36:10	36:40	3401	3400	
10	40:40	41:10	3196	3200	
11	45:20	45:50	3000	3000	
12	49:50	50:20	2798	2800	
13	54:20	54:50	2599	2600	
14	59:00	59:30	2403	2400	
15	18:03:50	18:04:20	2200	2200	
16	08:20	08:50	1998	2000	
17	12:40	13:10	1798	1800	
18	17:10	17:40	1600	1600	
19	21:40	22:10	1403	1400	
20	26:20	26:50	1199	1200	
21	30:50	31:20	1000	1000	
22	36:00	36:30	750	750	
23	41:15	41:45	498	500	
24	53:00	53:30	7	5	

Hawaii Ocean Time Series		Station #: 2	Cast #: 2	Box #: 4
Salinity Sample Log Sheet		Cruise #: HOT-258		Sampler: DM/JS
Niskin #	Depth	Serial #	Comments	
1	4800	73		
2	4600	74		
3	4500	75		
4	4400	76		
5	4200	77		
6	4000	78		
7	3800	79		
8	3600	80		
9	3400	81		
10	3200	82		
11	3000	83		
12	2800	84		
13	2600	85		
14	2400	86		
15	2200	87		
16	2000	88		
17	1800	89		
18	1600	90		
19	1400	91		
20	1200	92		
21	1000	93		
22	750	94		
23	500	95		
24	5	96		

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000 GPs	12L	25.05	DM

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS - Re-installed
 PO Fluorometer
 S-min: 500
 mixed: 50

Station: 2	Cast: 3
Latitude start: 22 44.989 end: 22 45.018	Longitude start: 158 0.015 end: 157 59.989
Depth of water: 4742 meters	Date (GMT): 12 / 20 / 13
Pressure on Deck	Time:
Begin: -0.45 End: -0.46	Start Log: 2112 In Water: 2114 Out of Water: 2240
Max cast pressure: 1020 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	21:46:20	21:46:50	1020	1020	
2	:49:00	:49:30	973	976	
3	:51:30	:52:00	932	933	
4	:54:00	:54:30	889	889	
5	:56:45	:57:15	846	845	
6	59:00	59:30	799	800	
7	22:01:10	22:01:40	755	755	
8	03:20	03:50	718	720	
9	05:20	05:50	684	685	
10	07:30	08:00	631	630	
11	09:20	09:50	591	590	
12	11:30	12:00	546	545	
13	13:20	13:50	520	520	
14	14:50	15:20	499	500	
15	16:40	17:10	460	460	
16	18:30	19:00	420	420	
17	20:40	21:10	357	355	
18	22:30	23:00	316	315	
19	24:40	25:10	260	263	
20	27:00	27:30	210	210	
21	29:20	29:50	154	155	
22	31:00	31:30	121	120	
23	32:50	33:30	87	85	
24	34:30	35:00	68	70	

Hawaii Ocean Time-Series

HOT - 258

Station: <u>2</u>	Cast: <u>3</u>
Latitude: <u>22°44.989</u>	Longitude: <u>158°0.015</u>
Date: <u>12/20/13</u>	Time (GMT): <u>21:12 →</u>
Operator: <u>DM</u>	

$\delta\theta$	$\sigma\theta$	Depth
700	20.76	_____
650	21.28	_____
600	21.80	_____
550	22.33	_____
500	22.85	_____
450	23.37	_____
400	23.90	<u>70</u>
350	24.42	<u>85</u>
300	24.95	<u>155</u>
250	25.47	<u>210</u>
200	26.00	<u>315</u>
180	26.21	<u>355</u>
160	26.42	<u>420</u>
140	26.63	<u>500</u>
130	26.73	<u>545</u>
120	26.84	<u>590</u>
110	26.94	<u>630</u>
100	27.05	<u>685</u>
90	27.16	<u>755</u>
80	27.26	<u>845</u>
70	27.37	<u>~1020</u>

S _{max}	<u>70</u>
S _{min}	<u>520</u>
S _{max}	_____
S _{min}	_____

O _{max}	<u>~85</u>
O _{min}	<u>800</u>
O _{max}	_____
O _{min}	_____
O _{max}	_____

F _{max}	_____
F _{min}	_____
F _{max}	_____
F _{min}	_____
F _{max}	_____

Bottle	Depth
1	<u>1020</u>
2	<u>976</u>
3	<u>933</u>
4	<u>889</u>
5	<u>845</u>
6	<u>800</u>
7	<u>755</u>
8	<u>720</u>
9	<u>685</u>
10	<u>630</u>
11	<u>590</u>
12	<u>545</u>
13	<u>520</u>
14	<u>500</u>
15	<u>460</u>
16	<u>420</u>
17	<u>355</u>
18	<u>315</u>
19	<u>263</u>
20	<u>210</u>
21	<u>155</u>
22	<u>120</u>
23	<u>85</u>
24	<u>70</u>

Hawaii Ocean Time Series			Station #: 2	Cast #: 3	Box #: 6
Salinity Sample Log Sheet			Cruise #: HOT-258		Sampler: DM/JS/DR
Niskin #	Depth	Serial #	Comments		
1	1020	121			
2	976	122			
3	933	123			
4	889	124			
5	845	125			
6	800	126			
7	755	127			
8	720	128			
9	685	129			
10	630	130			
11	590	131			
12	545	132			
13	520	133			
14	500	134			
15	460	135			
16	420	136			
17	355	137			
18	315	138			
19	263	139			
20	210	140			
21	155	141			
22	120	142			
23	85	143			
24	70	144			

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G10006PS	12L	25.00	CF

Station: 2	Cast: 4
Latitude start: 22 44.948 end: 22 45.024	Longitude start: 157 59.336 end: 157 59.360
Depth of water: 4742 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.50 End: -0.48	Start Log: 00:55 In Water: 00:59
Max cast pressure: 1020 dbar	Out of Water: 02:07

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 sal min: 500
 mixed layer: 65

Trip/ Niskin	Time	Confirm	Pressure	Target Depth	Comments
	stopped	tripped			
1	01:31:45	01:32:15	1018	1020	
2		:43:40	500	500	5-min
3		47:50	350	[350]	
4		48:00	351	[350]	
5		51:00	249	250	
6		53:06	202	200	
7		54:25	175	175	
8		55:40	150	150	
9		57:05	126	125	
10		58:35	103	100	
11		02:00:25	73	75	
12		02:35	47	45	
13		04:20	25	25	
14		06:20	7	5	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
C1000GPS	12L	25.18	JG / CF

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 Mixed layer : 70
 3-min: 500

Station: 2	Cast: 5
Latitude start: 22 44.33 end: 22 44.357	Longitude start: 158 1.977 end: 158 1.973
Depth of water: 4752 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.47 End: -0.43	Start Log: 02:50 In Water: 02:57
Max cast pressure: 1021 dbar	Out of Water: 04:03

Trip/ Niskin	Time	Confirm	Pressure	Target Depth	Comments
	stopped	tripped			
1	03:21:15	03:27:45	1021	1020	
2		38:20	500	500	Sal m/m
3		43:55	350	350	
4		44:05	351	350	
5		47:10	252	250	
6		49:35	200	200	
7		51:10	175	175	
8		52:45	150	150	
9		54:10	123	125	
10		55:40	99	100	
11		57:10	75	75	
12		58:40	45	45	
13		01:00:00	24	25	
14		01:50	6	5	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000	12L	25.05	CF/JE

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer

Mixed Layer: 85
 S-min: 490

Station: 2	Cast: 6
Latitude start: 22 41.675 end: 22 41.775	Longitude start: 158 4.790 end: 158 4.560
Depth of water: 4769 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck Begin: -0.44 End: -0.46	Time: Start Log: 06:00 In Water: 06:06 Out of Water: 07:19
Max cast pressure: 1021 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	06:36:00	06:36:30	1019	1020	
2		42:30	788	790	O ₂ min
3		49:20	490	490	Sal min
4		57:20	200	200	
5		59:15	175	175	
6		07:00:15	162	165	
7		:01:25	149	150	
8		02:45	128	130	
9		03:40	124	125	
10		04:35	114	115	
11		05:35	108	110	
12		06:45	99	100	
13		07:45	90	90	
14		08:40	86	85	
15		09:40	76	75	
16		10:50	61	60	
17		12:05	44	45	
18		13:00	34	35	
19		14:00	23	25	}
20		:10	23	25	
21		20	23	25	
22		16:10	16	15	
23		18:00	5	5	}
24		:10	5	5	

Hawaii Ocean Time Series			Station #: 2	Cast #: 6	Box #: 8/9
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: SG/CF	
Niskin #	Depth	Serial #	Comments		
1	1020	173			
2	790	174			
3	490	175			
4	200	176			
5	175	177			
6	165	178			
7	150	179			
8	130	180			
9	125	181			
10	115	182			
11	110	183			
12	100	184			
13	90	185			
14	85	186			
15	75	187			
16	60	188			
17	45	189			
18	35	190			
19	25	191			
20	25	192			
21	25	193			
22	15	194			
23	5	195			
24	5	196			

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GAS	12L	25.02	CF

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer

large sal dills (0.010) in upper 150

Station: 2	Cast: 7
Latitude start: 22 41.676 end: 22 41.631	Longitude start: 158 3.330 end: 158 3.330
Depth of water: 4768 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.48	Start Log: 09:00
End: -0.45	In Water: 09:09
Max cast pressure: 1021 dbar	Out of Water: 10:13

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
2		52:30	491	490	sal min
3		10:00:00	176	175	
4		02:00	150	150	
5		03:30	124	125	
6		05:00	96	100	
7		07:00	70	75	
8		09:00	45	45	
9		10:40	25	25	
10		1:50	24	25	
11		12:45	6	5	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G10006DS	12L	25.04	DM/CF

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer

mixed to 60 (Temp), 35 (sal)
 sal min: 490

Station: 2	Cast: 8
Latitude start: 22 42.511	Longitude start: 158 2.546
end: 22 42.543	end: 158 2.537
Depth of water: 4761 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.48	Start Log: 11:56
End: -0.42	In Water: 1203
Max cast pressure: 1021 dbar	Out of Water: 1314

Trip/ Niskin	Time	Confirm	Pressure	Target Depth	Comments
	stopped	tripped			
1	12:40:30	12:41:00	1017	1020	
2	53:00	53:30	491	490	sal min
3	13:01:40	13:03:10	125	[125]	
4		:20	123	[125]	
5	03:40	04:10	99	[100]	
6		:20	97	[100]	
7	06:00	06:30	75	[75]	
8		:40	73	[75]	
9	08:40	09:10	44	[45]	
10		:20	43	[45]	
11	10:50	11:20	23	[25]	
12		:30	23	[25]	
13		:40	23	[25]	
14	13:10	13:40	7	[5]	
15		:50	8	[5]	
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
61000GPS	12L	25.02	DM

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 s-min: 500
 mixed: 60 dbar (80 for T, O₂)

Station: 2	Cast: 9
Latitude start: 22 44.891 end: 22 44.931	Longitude start: 158 2.043 end: 158 2.034
Depth of water: 4750 meters	Date (GMT): 12 / 21 / 2013
Pressure on Deck	Time:
Begin: -0.46 End: -0.47	Start Log: 1451 In Water: 1457 Out of Water: 1618
Max cast pressure: 1022 dbar	

Trip/ Niskin	Time	Confirm	Pressure	Target Depth	Comments
	stopped	tripped			
X 1	15:29:50	15:30:20	1022	1020	
X 2	41:30	42:00	501	500	s-min
3	48:50	49:20	200	200	
4	50:50	51:20	174	175	
5	52:30	53:00	159	160	
6	53:40	54:10	154	150	*Big oscillations during bottle fire
7	55:00	55:20	144	145	(~7 m)
8	56:10	56:30	142	140	
9	57:20	57:50	132	135	
10	58:20	58:50	130	130	
11	59:30	16:00:00	123	125	
12	16:00:30	01:00	120	120	
13	01:30	02:00	117	115	mrk ~ 121, big oscillations
14	02:40	03:10	110	110	
15	03:40	04:10	105	105	
16	04:40	05:10	97	100	
17	05:40	06:10	92	95	
18	06:40	07:10	89	90	
19	07:30	08:00	84	85	
20	08:30	09:00	76	75	
21	09:40	10:10	64	65	
22	11:00	11:30	46	45	
23	13:20	13:50	24	25	
X 24	17:40	18:10	6	5	-CTD came out, resubmerged to 12m and brought back to 5m

Hawaii Ocean Time Series			Station #: 2	Cast #: 9	Box #: 10
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS	
Niskin #	Depth	Serial #	Comments		
1	1020	221			
2	500	222	5-min		
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24	5	223			

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GPS	12L	24.93	DM

Station: 2	Cast: 10
Latitude start: 22 45.037 end: 22 45.011	Longitude start: 157 59.998 end: 158 0.001
Depth of water: 4742 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.44 End: -0.47	Start Log: 1755 In Water: 1802 Out of Water: 1910
Max cast pressure: 1021 dbar	

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 mixed: 80
 sal min: 500

Trip/ Niskin	Time	Confirm	Pressure	Target Depth	Comments
	stopped	tripped			
1	18:35:00	18:35:30	1019	1020	
2	45:30	46:00	499	500	s-min
3	52:30	53:00	179	[175]	
4		:10	176	[175]	
5	54:50	55:20	152	[150]	
6		:30	153	[150]	
7	57:00	57:30	122	[125]	
8		:40	123	[125]	
9	59:10	59:40	101	[100]	
10		:50	101	[100]	
11	19:01:20	19:01:50	75	[75]	
12		02:00	72	[75]	
13	03:50	04:20	44	[45]	
14		:30	46	[45]	
15	06:00	06:30	26	[25]	
16		:40	26	[25]	
17		:50	26	[25]	
18	08:30	09:00	8	[5]	
19		:10	8	[5]	
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GPS	12L	25.06	DM

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 sal min: 490
 mixed: 65

*sharp increase
 in salinity at
 600 dbar.

Station: 2	Cast: 11
Latitude start: 22 44.879 end: 22 44.858	Longitude start: 157 59.237 end: 157 59.242
Depth of water: 4738 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.44 End: -0.48	Start Log: 2102 In Water: 2109 Out of Water: 2215
Max cast pressure: 1021 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	21:41:20	21:41:50	1021	1020	
2	52:10	52:40	491	490	s-min
3	59:16	59:40	174	[175]	
4		:50	173	[175]	
5	22:01:00	22:01:30	149	[150]	
6		:40	149	[150]	
7	02:40	03:10	125	[125]	
8		:20	127	[125]	
9	04:30	05:00	100	[100]	
10		:10	99	[100]	
11	06:20	06:50	77	[75]	
12		07:00	77	[75]	
13	08:00	08:30	47	[45]	
14		:40	45	[45]	
15	09:50	10:20	23	[25]	
16		:30	22	[25]	
17		:40	22	[25]	
18	12:10	12:40	7	[5]	
19		:50	8	[5]	
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GPS	12L	25.25	DM/JG

Station: 2	Cast: 12
Latitude start: 22 44.899 end: 22 44.865	Longitude start: 157 57.306 end: 157 57.303
Depth of water: 4724 meters	Date (GMT): 12 122 1 13
Pressure on Deck	Time:
Begin: -0.45 End: -0.45	Start Log: 0039 In Water: 0043 Out of Water: 0203
Max cast pressure: 1022 dbar	

- Pinger
- Altimeter
- Transmissometer
- BEACH Sea Tech Fluorometer
- OTG Seapoint Fluorometer
- ISUS
- PO Fluorometer
- s-min: 490
mixed: 40 dbar

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
2		22:30	900	900	
3		25:10	796	800	
4		26:40	770	770	
5		29:05	699	700	
6		31:55	600	600	
7		35:20	498	500	
8		35:30	498	500	
9		37:00	490	490	s-min
10		40:10	399	400	
11		42:50	348	350	
12		44:55	300	300	
13		45:05	300	300	
14		47:15	251	250	
15		49:20	201	200	
16		49:30	199	200	
17		51:40	150	150	
18		53:20	126	125	
19		54:55	99	100	
20		56:25	76	75	
21		58:10	44	45	
22		02:00:00	25	25	
23		:10	25	25	
24		02:10	5	5	

Hawaii Ocean Time Series		Station #: 2	Cast #: 12	Box #: 10, 11
Salinity Sample Log Sheet		Cruise #: HOT-258		Sampler: CF/JG/DZ
Niskin #	Depth	Serial #	Comments	
x 1	1020	237		
2				
3				
4				
5				
6				
7				
8				
x 9		238	5-min	
10				
x 11	350	239		
12	>			
13				
x 14	250	240		
15				
16				
x 17	150	241		
x 18	125	242		
x 19	100	243		
x 20	75	244		
x 21	45	245		
x 22	25	246		
23				
x 24	5	247		

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
91000GPS	12L	25.13	CF

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 S-min: 500
 Mixed Layer: 55

Station: 2	Cast: 13
Latitude start: 22 45.205 end: 22 45.242	Longitude start: 157 55.157 end: 157 55.068
Depth of water: 4712 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.48	Start Log: 0257
End: -0.46	In Water: 0303
Max cast pressure: 1022 dbar	Out of Water: 04:06

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1		03:35:35	1021	1020	
2		46:05	500	500	sal min
3		53:00	175	175	
4		54:20	151	150	
5		56:05	127	125	
6		57:40	101	100	
7		59:30	75	75	
8		06:01:30	45	45	
9		03:10	26	25	J
10		:20	26	25	
11		05:10	6	5	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series		Station #:	2	Cast #:	13	Box #:	11
Salinity Sample Log Sheet		Cruise #:		HOT- 258		Sampler:	
Niskin #	Depth	Serial #	Comments				
1	1020	248					
2	sal mix	249					
3							
4							
5							
6							
7							
8							
9							
10							
11	5	250					
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000CIPS	12 L	24.96	CF/JG

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer

Station: 2	Cast: 14
Latitude start: 22 45.243 end: 22 45.270	Longitude start: 157 54.935 end: 157 54.934
Depth of water: 4707 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.47 End: -0.49	Start Log: 06:01 In Water: 06:06
Max cast pressure: 1020 dbar	Out of Water: 07:11

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	06:35:35	06:36:05	1020	1020	
2		47:05	501	500	sal min
3		54:25	177	175	
4		54:35	177	175	
5		55:50	153	150	
6		56:00	153	150	
7		57:05	135	135	
8		58:15	123	125	
9		58:25	123	125	
10		59:25	112	115	
11		07:00:55	98	100	
12		01:05	99	100	
13		02:15	86	85	
14		03:25	73	75	
15		03:35	74	75	
16		05:05	57	60	
17		06:15	45	45	
18		06:25	45	45	
19		07:55	24	25	
20		08:05	25	25	
21		10:30	6	5	
22		14:00	6	5	
23					
24					

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Hawaii Ocean Time-Series CONSOLE LOG

-DEEP CAST # 2-

Cast type	Bottle type	SST	Operator
65000GPS	12	24.97	JG/CF

Station: 2	Cast: 15
Latitude start: 22 45.003	Longitude start: 157 59.995
end: 22 44.973	end: 157 59.997
Depth of water: 4742 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.42	Start Log: 0908
End: -0.60	In Water: 09:21
Max cast pressure: 4811 dbar	Out of Water: 12:53

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer
 Mixed Layer - 35
 Sal Min - 500

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
2		17:20	4502	4500	
3		27:10	4001	4000	
4		27:20	4001	4000	
5		47:35	3003	3000	
6		47:45	3002	3000	
7		12:07:15	2000	2000	
8		07:30	2000	2000	
9		26:10	1001	1000	
10		30:45	819	820	O ₂ min
11		37:20	500	500	sal min
12		45:35	87	90	O ₂ max
13		49:10	25	25	
14	12:51:30	52:00	6	5	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
6200 GPS	12L	25.00	DM

Station: 52	Cast: 1
Latitude start: 22 39.748	Longitude start: 157 57.765
end: 22 39.903	end: 157 57.841
Depth of water: 4750 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.43	Start Log: 1845
End: -0.43	In Water: 1850
Max cast pressure: 201 dbar	Out of Water: 1954

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS - Removed
 PO Fluorometer
 mixed: 50 dbar

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	19:50:00	19:50:30	25	25	
2		19:53:00	2	5	-surface water request. LTD
3					tripped ~ 10 seconds after
4					winch all-stop.
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

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Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G2500GPS	12L	25.51	SG/CF

- Pinger
 Altimeter
 Transmissometer
 BEACH Sea Tech Fluorometer
 OTG Seapoint Fluorometer
 ISUS
 PO Fluorometer

Station: 6	Cast: 1
Latitude start: 21 50.859 end: 21 50.806	Longitude start: 158 21.806 end: 158 21.793
Depth of water: 2464 meters	Date (GMT): 12/22/13
Pressure on Deck	Time:
Begin: -0.44	Start Log: 06:02
End: -0.45	In Water: 06:08
Max cast pressure: 2451 dbar	Out of Water: 08:09

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1		07:07:15	2450	2500	
2		07:17:30	2000	2000	
3		29:05	1500	1500	
4		39:55	1000	1000	
5		50:55	502	500	
6		58:20	177	175	
7		59:40	151	150	
8		08:06:55	125	125	
9		02:10	101	100	
10		03:35	75	75	
11		05:00	45	45	
12		06:05	25	25	
13		08:00	8	5	
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

CTD Configurations

CTD: 850

Deck Unit: 111361

Pressure: 1430

Carousel: 518

T₁: 1416 T₂: 5519C₁: 2218 C₂: 2959O₁: 918 O₂: 1601Pump₁: 968 Pump₂: 368

Fluorometer: 3199

AHimeter: 9149

Bucket Thermometer: 201002

Transmissometer: -CST-1192 DR / C-STAR wet Lab

Cruise Participants

A. Harlan

D. Sadler

B. Urdyke

J. Snyder

D. McCoy

K. Björkman

S. Curless

C. Fumar

J. Gurn

S. Goldberg

D. Rosbrugh

B. Watkins

B. Barone

K. Doggett

Anne Thompson - BD Sciences (Seattle)

Erica Goetze - UH professor

Russell Hopcroft - U of Alaska

S. Thomas

C. Schwarz

T. Young

D. Fitzgerald } OTG

0845 Depart

0815 Safety

0800 Fire

0838 Arrive

0843 Start

0829 End W

0854 Start

0813 End S

0821 Start

0858 End h

0802 Transi:

0858 Arrive

0903 start

[22° 44,

0923 End Sed

0937 Start

1010 End

- 1845 Depart SNUG Harbor
- 1915 Safety Meeting
- 2000 Fire and safety drill
- 2138 Arrive Fake point (Station 1)
- 2143 Start weight cast to 500m
- 2229 End weight cast
- 2254 Start Station 1 cast 1 - G1000GPS
- 0013 End Station 1 cast 1 - 24 marks OK
- 0021 Start Hyperpro cast @ $21^{\circ}20.610'N$ $158^{\circ}16'44.2''W$
- 0058 End hyperpro cast @ $21^{\circ}20.003'N$ $158^{\circ}15.990'W$
- 0102 Transit ALOHA
- 0858 Arrive at station ALOHA
- 0903 start Sed Trap Deployment
[$22^{\circ}44.991'N$; $158^{\circ}3.227'W$]
- 0923 End Sed Traps Deployment
- 0937 Start NetTow (Erica Goetze)
- 1010 End Net Tow #1 / start Net Tow #2 (Blake)

Jet Lab

OTG
d

bottle)

* Add to procedures binder before HOT-259

- Error w/ CBIRD-W on ACQ computer when DOS window isn't closed properly.
- To fix, copy 'Seasave.cfg' from comp desktop into D:/ctd-dos/prog
- Try to run the cast again

44 End Ne

50 start st
• large swe slowed down

• ISUS has to 500

613 End state

12/20/13 Transmissometer Calibration Notes:

22:33 UTC Dark Offset: Uncovered Offset
volts = 0.07692 volts = 4.77167
atten = 29.46162 atten = -0.06783

621 Begin dt

636 PD array

- * To do Transmissometer test - start normal G-1000 GPS cast, look at values at "Voltage 7" and "Beam Attenuation, Chelson/Seatech/WET Lab, CStar, 2 [1/m]" on ACQ display in Fixed Display 2 & Fixed Display 1 respectively.

651 Start S

658 10m off

657 End sta

Thermosalinograph notes:

Low water pressure from thermosalinograph during first few hours of cruise. Had OTG fix water pressure in the underway seawater system @ 12/20/13 04:00:00 (GMT). Int and Ext temp offsets returned to expected ranges after. Consider removing all bottle samples before this time as they are likely outliers.

1900 Transit

2010 STA
22°

2112 Start
• ISUS was

• ISUS of #1

1044 End Net Tow

1150 Start Station 2 Cast 1 - G1000 GPS

- large swell (about 10 ft) in water, winch speeds slowed down. 20 m/min in upper 150 m.

- ISUS has noise/spikes in data (or) signal drop-outs to 500 dbar.

1313 End station 2 cast 1 - 22 marks OK

1421 Begin deploying PP array

1436 PP array deployed @ $22^{\circ}45.011'N$ $158^{\circ}2.020'W$

1501 Start Station 2 cast 2 - G5000 GPS

1658 10m off @ $22^{\circ}45.053'N$ $157^{\circ}59.979'W$ (4805 dbar)

1857 End station 2 cast 2 - 23 marks OK, 1 bad

1900 Transit pump tanks

2010 START NET TOW

$22^{\circ}42.14$ $158^{\circ}04.22$

2112 Start station 2 cast 3 - G1000 GPS

- ISUS not recording any data Package was re-installed prior to the cast

- ISUS data returns (low quality) @ 300 dbar of the downcast.

HOT-258

Dec 20 2013

2242 End station 2 cast 3 - 23 marks OK / 1 bad
RESET ISUS CABLE AT ISUS BULKHEAD

2318 Start net tow @ 22°45.022'N 157°59.996'W
◦ For Erica Goetze

* Delayed 15 minutes due to brake issues on
the 680 winch.

2357 End net tow @ 22°44.953'N 157°59.392'W

Dec 21, 2013

0002 Deploy Hyperpro @ 22°44.959'N 157°59.342'W

0043 End hyperpro deployment @ 22°44.957'N 157°59.340'W

00:55 start station 2 cast 4 - 61000GPS

02:11 End station 2 cast 4 - 14 marks ok

02:50 start station 2 cast 5 - 61000GPS

04:05 End station 2 cast 5 - 14 marks ok

0430 start PP Array Recovery
[22° 43.921' N ; 158° 2.291' W]

0438 Lost Ship's line on PP array, turning around to
regrapple PP array

0458 New line on buoy; re-start PP Array Recovery
[22° 43.965' N ; 158° 2.261' W]

0512 End PP Array Recovery

0515 PUMP RUN

0600 start

0729 End

0759 start

0828 End N

0852 End Ne

0900 start

1016 End

10:26 start

11:18 End Ne

1148 End N

1156 start S

Niskins # 7, 13 vents were found
open after recovery.



1316 End start

1400 ETA
22°

1451 start S

1613 (T) SW
recovery

HOT-258

DEC 21, 2013

0600 start station 2 cast 6 - 61000 GPS

0729 End station 2 cast 6 - 24 marks ok

0759 start Net Tow #1 (Blake)

0828 End Net Tow #1 / start Net Tow #2

0857 End Net Tow

0900 start station 2 cast 7 - 61000 GPS

1016 End station 2 cast 7 - 11 marks ok

10:26 start Net Tow #1 (Erica)

11:18 End Net Tow #1 / start Net Tow #2

1148 End Net Tow #2

1156 start station 2 cast 8 - 61000 GPS

1316 End station 2 cast 8 - 14 marks OK / 1 bad

1400 START G.A. DEPLOYMENT
22° 42.57 158° 02.53

1451 start station 2 cast 9 - 61000 GPS

1618 CTD surfaced before taking 5m sample
resubmerged to 15m to allow for pumps
to turn back on, then took sample at 5m

HOT-258

Dec 22, 13

1620 End station 2 cast 9 - 22 marks Ok.
2 marks bad due to > 5m oscillations

1630 Transit pump run

1755 Start station 2 cast 10 - G1000GPS
- raining on station -

1910 Stop station 2 cast 10 - 19 marks Ok

1957 Start net tow @ $22^{\circ}45.030'N$ $157^{\circ}59.974'W$

2030 End net tow @ $22^{\circ}44.919'N$ $157^{\circ}59.340'W$

2035 Start ATE deployment +
- $22^{\circ}44.914'N$ $157^{\circ}59.329'W$

2058 ATE recovered

2102 Start station 2 cast 11 - G1000GPS

2116 End station 2 cast 11 - 19 marks Ok

2226 Net tow @ $22^{\circ}44.872'N$ $157^{\circ}59.199'W$
- Blake -

2257 End net tow @ $22^{\circ}44.882'N$ $157^{\circ}58.707$

2302 Erica's Net tow @ $22^{\circ}44.883'N$ $157^{\circ}58.627'W$

2333 Net recovered @ $22^{\circ}44.887'N$ $157^{\circ}58.088'W$

2334 Erica's Net tow @ $22^{\circ}44.887'N$ $157^{\circ}58.063'W$

2359 Net recovered @ $22^{\circ}44.903'N$ $157^{\circ}57.895'W$

vents 4,6,7,8 were open



0202 Erica's 3

0230 End net

0239 Start S

0209 End st

0240 Transit to

0257 start
- rain c

0410 End s

0544 Shallow

0551 Net To

0601 start c

0716 End c

0720 transit

0730 Start ^E

0800 End Ne

08:08 Start E

Dec 22nd, 2013

- 0002 Erica's 3rd net tow @ $22^{\circ}44.902'N$ $157^{\circ}57.856'W$
- 0030 End net tow @ $22^{\circ}44.903'N$ $157^{\circ}57.349'W$
- 0039 Start Station 2 cast 12 - 61000 GPS
- 0209 End station 2 cast 12 - 24 marks ok
- 0210 Transit to pump tanks
- 0257 start station 2 cast 13 - 91000 GPS
- rain on station just before cast
- 0410 End station 2 cast 13 - 11 marks ok
- 0544 Shallow Net Tow in water @ $22^{\circ}45.224'N$,
 $157^{\circ}55.068'W$
- 0559 Net Tow out of water
- 0601 start station 2 cast 14 - 91000 GPS
- 0716 End station 2 cast 14 - 22 marks ok
- 0720 transit to center
- 0730 Start ^{Erica's} Net Tow @ $22^{\circ}45.085'N$, $157^{\circ}56.688'W$
- 0800 End Net Tow
- 08:08 Start Blake Net Tow @ $22^{\circ}45.127'N$ $157^{\circ}57.414'W$
- 08:38 End Net Tow

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Dec 22, 2013

0843 start Net Tow

0900 End Net Tow

0901 Transit to center (~2 miles)

0908 start Station 2 Cast 15 - G5000CIPS
- Deep Cast #2 -

11:10 Reached 4810 dbar @ $22^{\circ}44.976'N$, $157^{\circ}59.987'W$
(5m off bottom)

1254 End station 2 cast 15 - 14 marks OK

1308 start AC9/FRRF @ $22^{\circ}44.975'N$ $157^{\circ}59.998'W$

1358 AC9 recovered

1402 AC9 re-deployed @ $22^{\circ}44.976'N$ $157^{\circ}59.999'W$

1454 AC9 recovered

1500 Transit gas array

1600 Gas array recovered @ $22^{\circ}41.994'N$ $158^{\circ}1.483'W$

1607 Transit sediment traps

1655 Sediment traps recovered @ $22^{\circ}44.567'N$ $158^{\circ}3.733'W$

1705 Transit pump run

1845 Start station 52 cast 1 - G200 GPS
- WHOTS mooring cast -

1855 start cycle #1

1913 start cycle #2

1931 start cycle #3

cycles #4 & 5 cancelled due to AC9/FBRF

1956 End station 52 cast 1 - 2 marks OK

2006 Deploying AC9 @ $22^{\circ}39.849'N$ $157^{\circ}57.959'W$

2059 AC9 recovered!

2103 AC9 re-deployed @ $22^{\circ}39.816'N$ $157^{\circ}57.956'W$

2155 AC9 recovered

2209 Net tow (Erica) @ $22^{\circ}39.801'N$ $157^{\circ}57.933'W$

2220 Net recovered

2355 START HYPER PRO
 $22^{\circ}39.81$ $157^{\circ}57.90$

December 23, 2013

0045 Hyperpro recovered

0100 Deploy Erica's Net Tow @ $22^{\circ}39.809'N$, $157^{\circ}57.876'W$

0111 End Net Tow

0114 Start transit to Kaena

0558 Arrive at St. 6 Kaena

HOT-258Dec. 22, 2013

0602 Start station 6 Cast 1 - G2500GPS

0707 10m off bottom (2450dbar) @ 21 50.814°N, 158 21.793°W

0812 End station 6 Cast 1 - marks ok

0815 Transit to snug Harbor

CCHDO Data Processing Notes

Date	Person	Data Type	Action	Summary
2014-10-08	Diggs, Steve	CTD/BTL/DOC	Submitted	WOCE formatted data
One ZIP archive includes WOCE formats for CTD and BOT. Two cruise reports included. ExpoCode needs to be changed from 33KB258/1 to 33KB20131219.				