

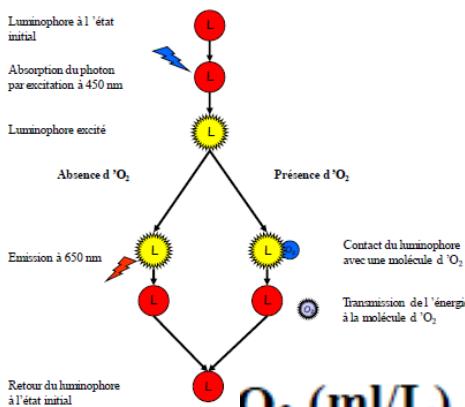
Microcat 37SMP(IMP) ODO SBE 63



Measurement Range	120% of surface saturation in all natural waters, fresh and salt								
Initial Accuracy	Larger of $\pm 3 \mu\text{mol/kg}$ (equivalent to 0.07 mL/L or 0.1 mg/L) or $\pm 2\%$								
Resolution	0.2 $\mu\text{mol/kg}$								
Sample-Based Drift	< 1 $\mu\text{mol/kg}$ / 100,000 samples (20 °C)								
Response Time (T, 63% response)	< 6 sec (20 °C)								
Sampling Speed	1 Hz (1 sample/sec)								
Calibration	Each sensor fully and individually calibrated (0 – 450 $\mu\text{mol/kg}$ oxygen, 0 – 30 °C, 0 – 35 psu, 0 – 2000 dbars) 8 coefficients plus 4 temperature compensation coefficients								
Input Power	6 - 24 VDC, 35 mA (0.08 J/sample)								
Output Signal	RS-232, 600-115,200 baud (user-selectable), 8 data bits, no parity, 1 stop.								
Depth rating, housing, and weight (in air)	<p><i>Sensor:</i></p> <table> <tr> <td>600 m (1960 ft) plastic housing:</td> <td>245 g (0.54 lbs)</td> </tr> <tr> <td>7000 m (22,960 ft) titanium housing:</td> <td>270 g (0.60 lbs)</td> </tr> </table> <p><i>Optional sensor mount for use with SBE 16plus V2, 16plus-IM V2, or 19plus V2 SeaCAT:</i></p> <table> <tr> <td>5000 m (16,400 ft) plastic mount</td> <td>190 g (0.42 lbs)</td> </tr> <tr> <td>7000 m (22,960 ft) titanium mount</td> <td>545 g (1.2 lbs)</td> </tr> </table>	600 m (1960 ft) plastic housing:	245 g (0.54 lbs)	7000 m (22,960 ft) titanium housing:	270 g (0.60 lbs)	5000 m (16,400 ft) plastic mount	190 g (0.42 lbs)	7000 m (22,960 ft) titanium mount	545 g (1.2 lbs)
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Presens technology

(Ruthenium based)



$$O_2 \text{ (ml/L)} = [(a_0 + a_1 T + a_2 V^2) / (b_0 + b_1 V) - 1] / K_{sv} [S_{corr}] [P_{corr}]$$

where

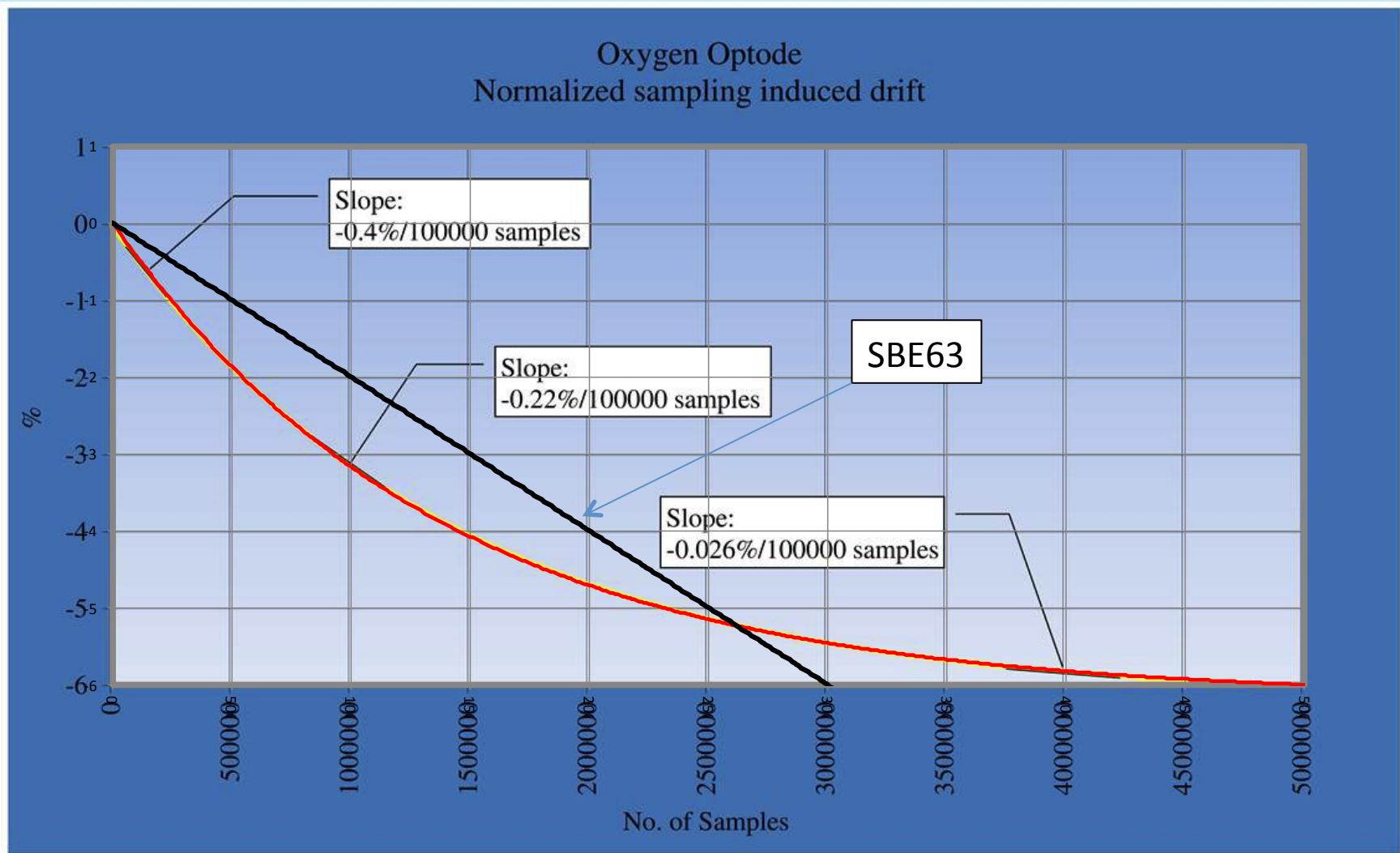
- O_2 is oxygen concentration (ml/L)
- T is temperature output from SBE 63's thermistor in °C
- V is raw measured phase delay in volts = $\varphi_r / 39.457071$ (see Note)
- φ_r is raw measured phase delay in μ sec (output when **SetFormat=1**)
- a_0, a_1, a_2, b_0, b_1 are calibration coefficients (Uchida et al, 2008)
- K_{sv} is Stern-Volmer constant (with calibration coefficients c_0, c_1, c_2) (Demas et al, 1999)
- S_{corr} is salinity correction function (with calibration coefficients $Sol_{B0}, Sol_{B1}, Sol_{B2}, Sol_{B3}, Sol_{C0}$)
- P_{corr} is pressure correction function (with calibration coefficient E)

Configuration

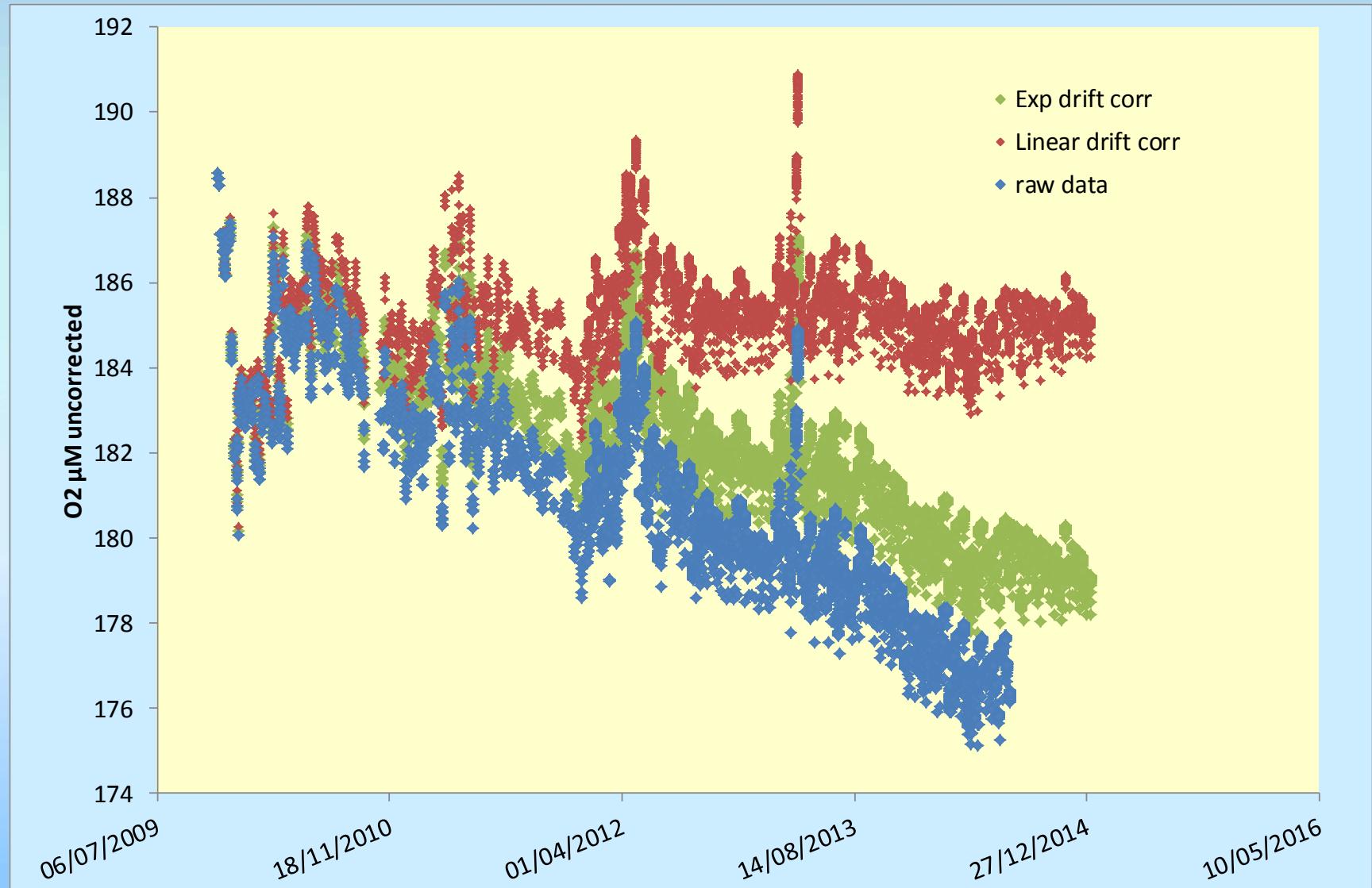
- SetFormat=1
 - x=1: **Raw phase delay and thermistor voltage, converted oxygen and temperature (no units), for compatibility with Argo CTD, SeaCATs (16plus V2, 16plus-IM V2, 19plus V2), and SBE 37 MicroCATs (SMP-ODO, IMP-ODO). Default.**
- Example:
 - 16.411 = raw phase delay
 - 0.550736 = raw thermistor voltage
 - 5.980 = converted oxygen in ml/l
 - 25.0011 = temperature in deg C
- iiOutputOx=1

SBE 63 Drift vs Optode Aanderaa

- SBE63 : $<1 \mu\text{mol kg}^{-1}$ per 100 000 samples @ 20°C
- Aanderaa : Exponential decrease

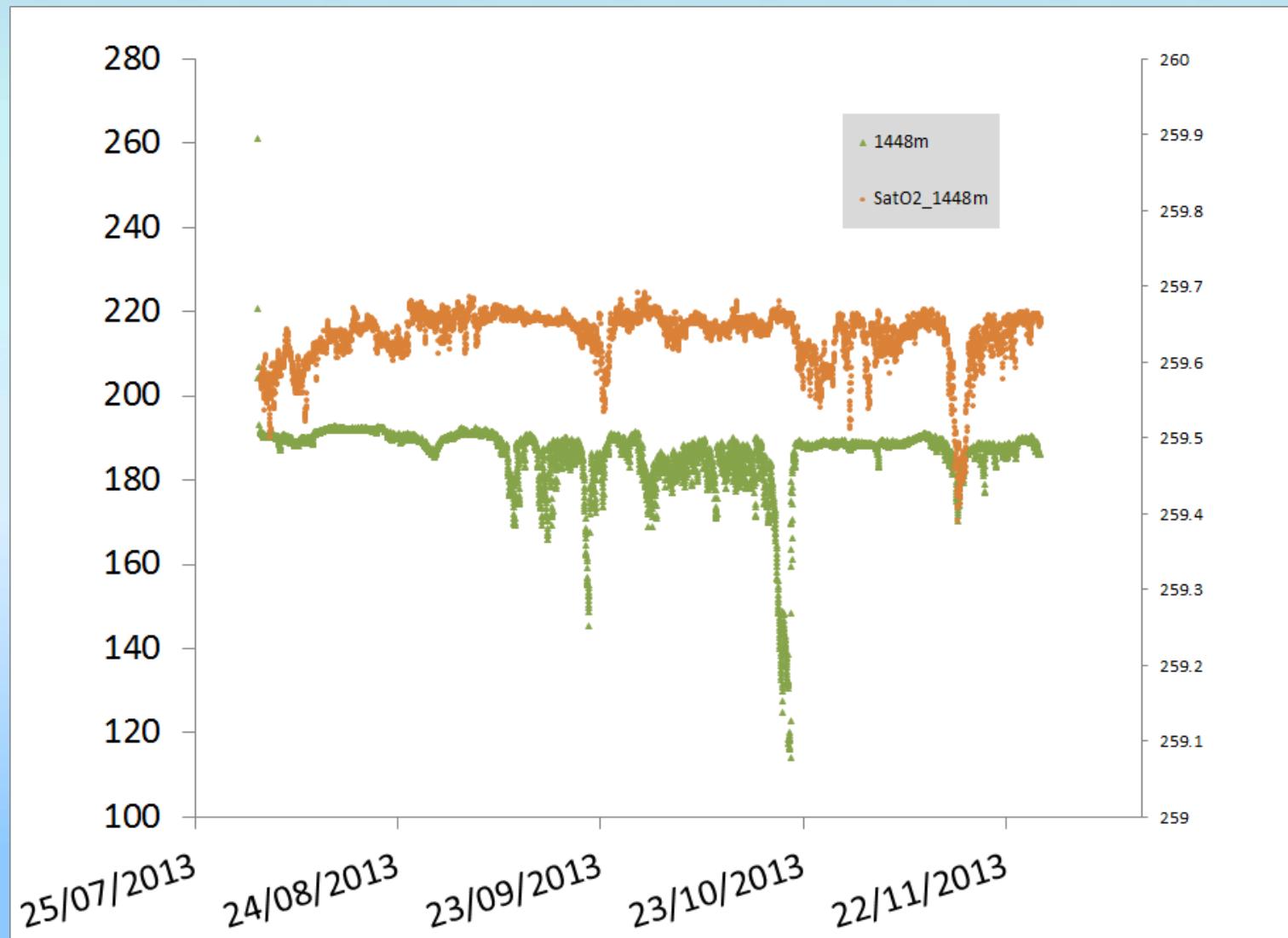


ANTARES Time series

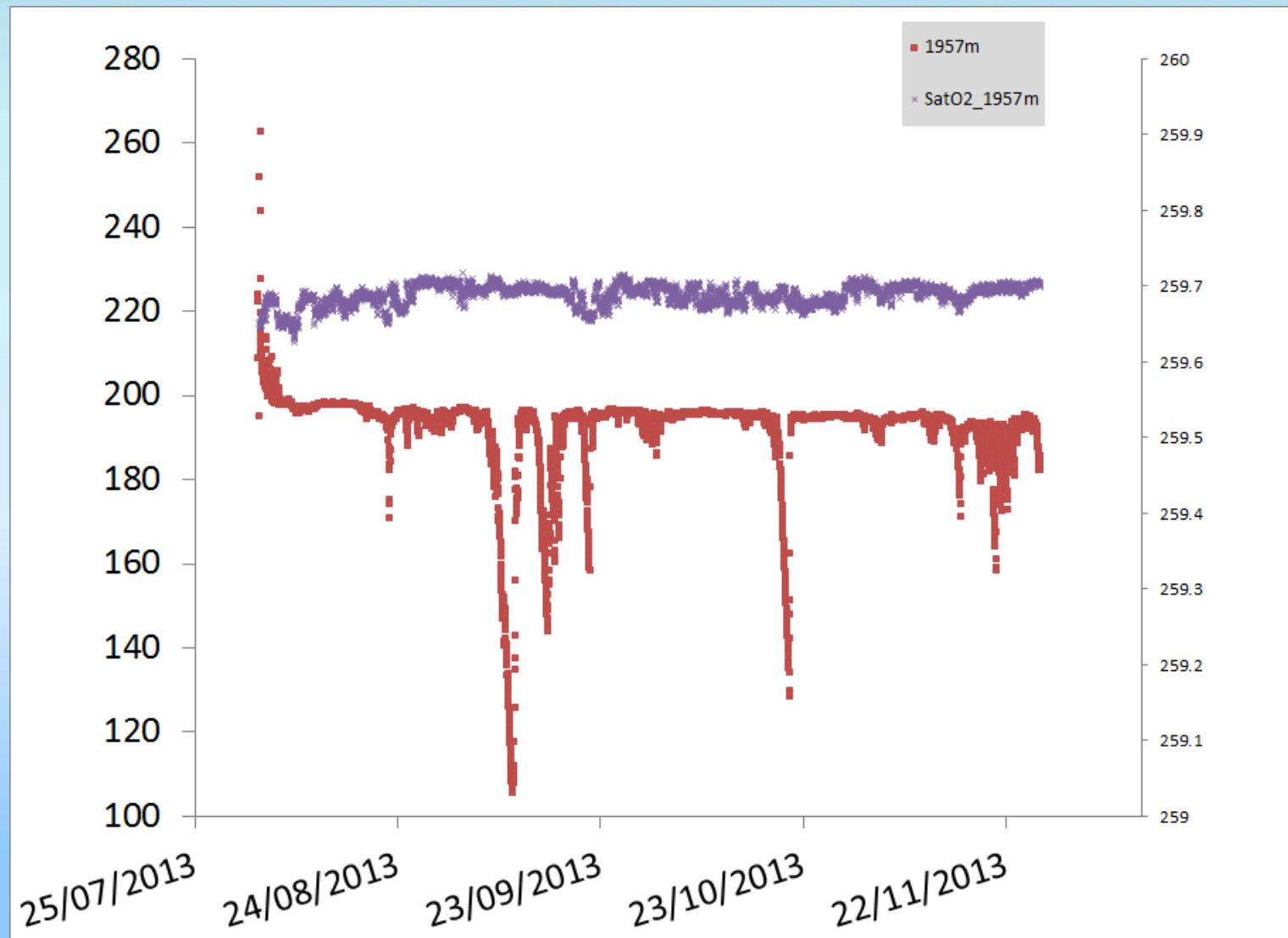


What should we do ?

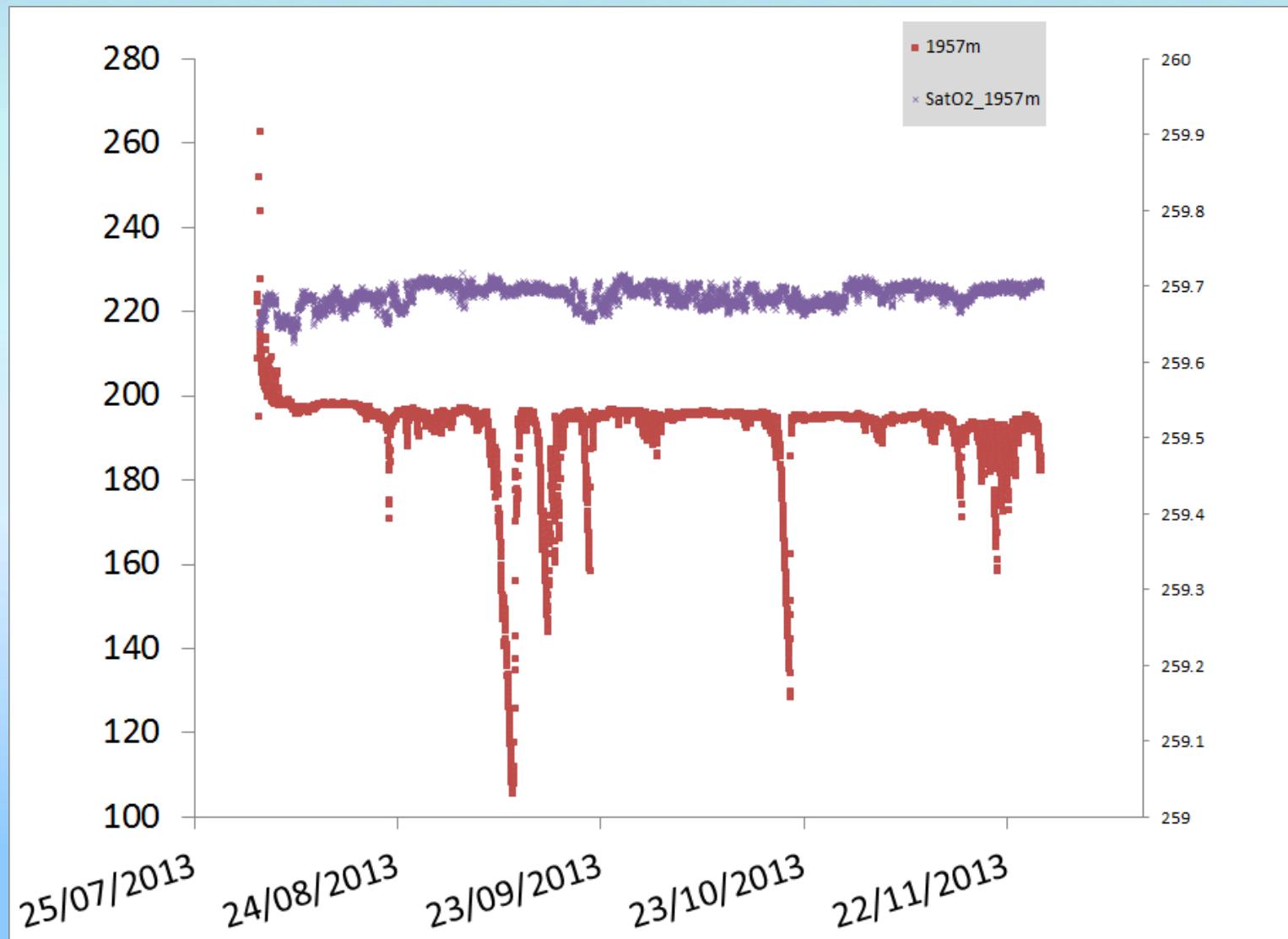
MEUST - EMSO



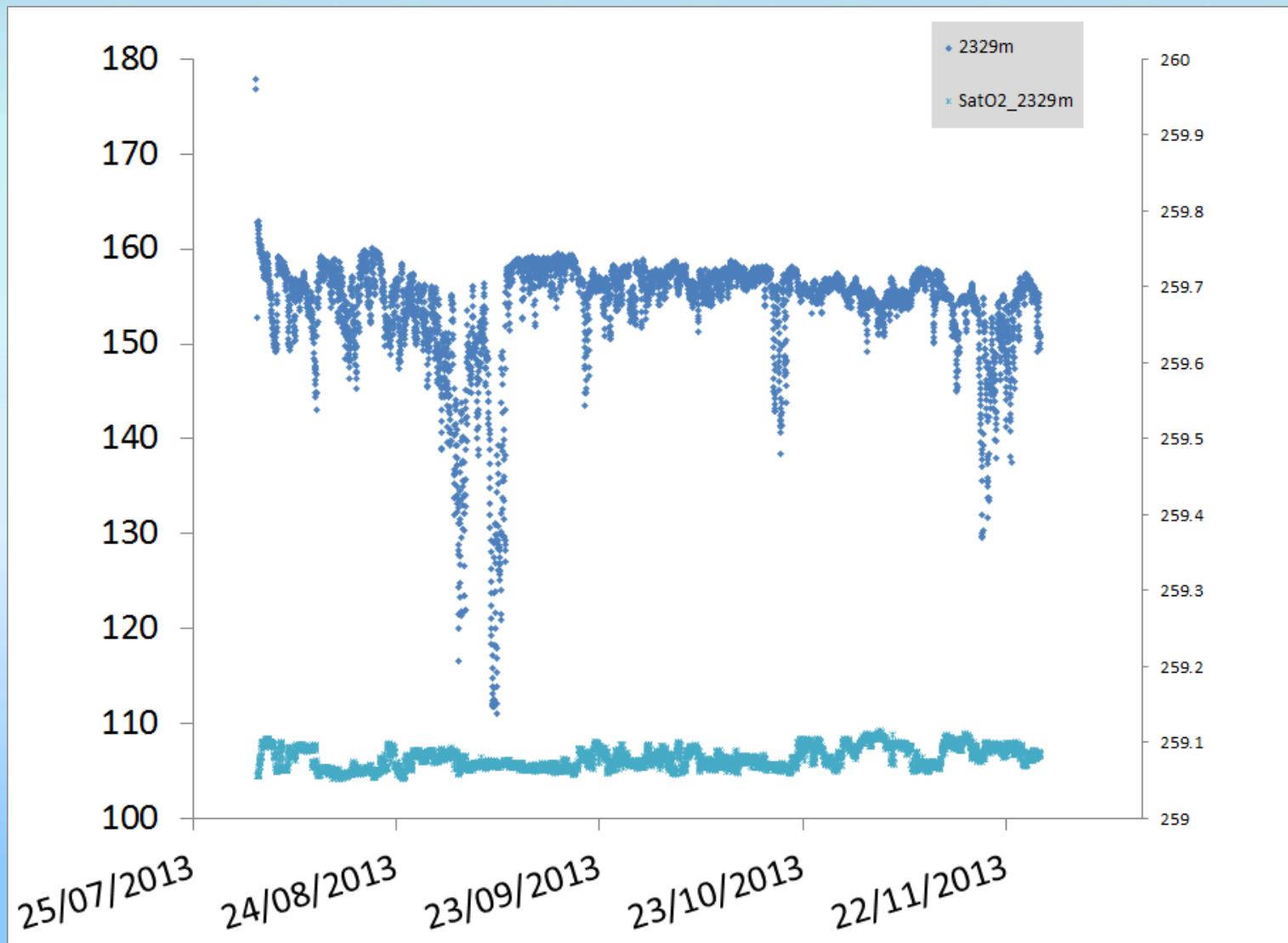
MEUST - EMSO



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MEUST - EMSO

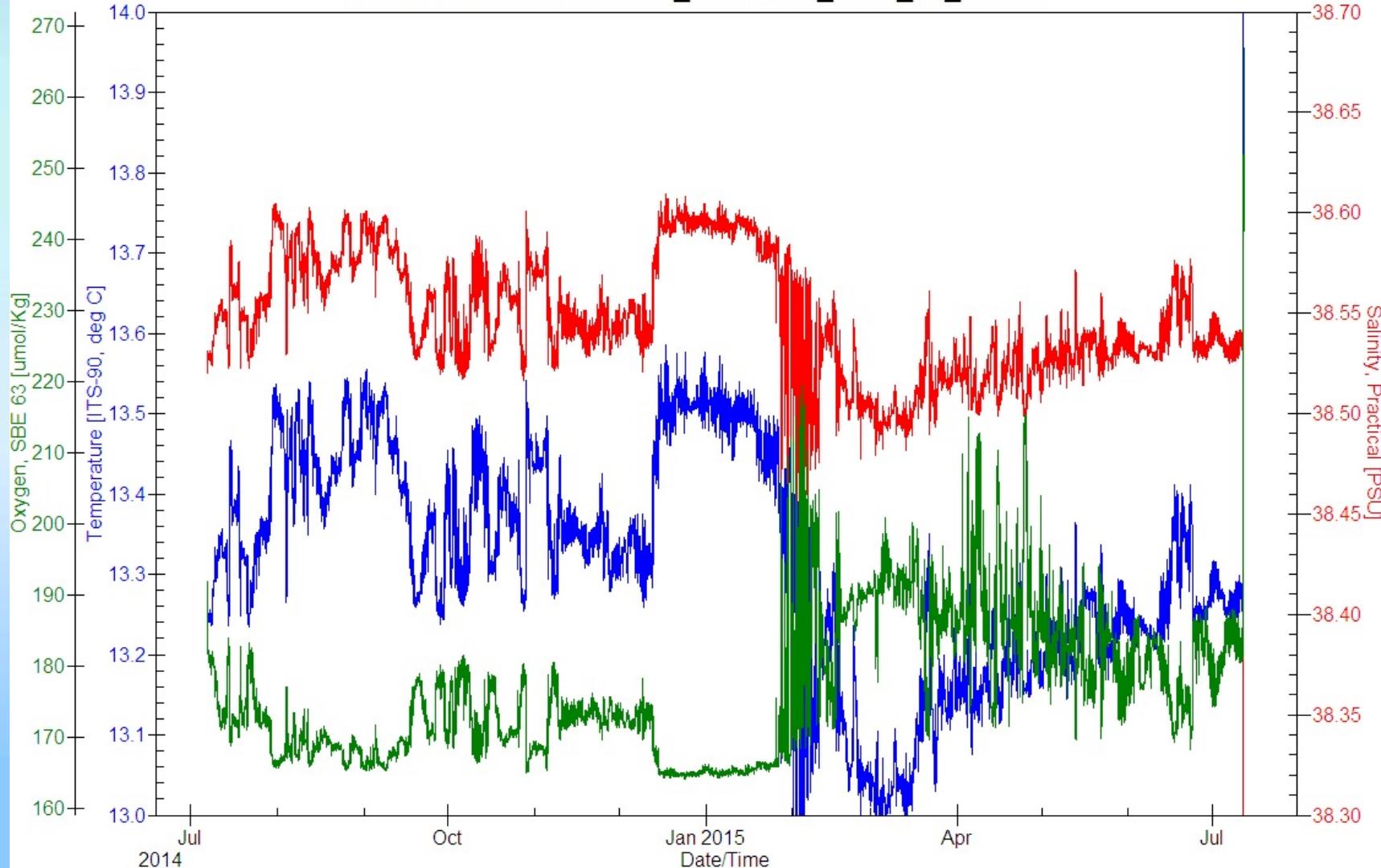


LION 350 m

<TAU20>5.000000e+00</TAU20>

<NTAU>4.000000e+00</NTAU>

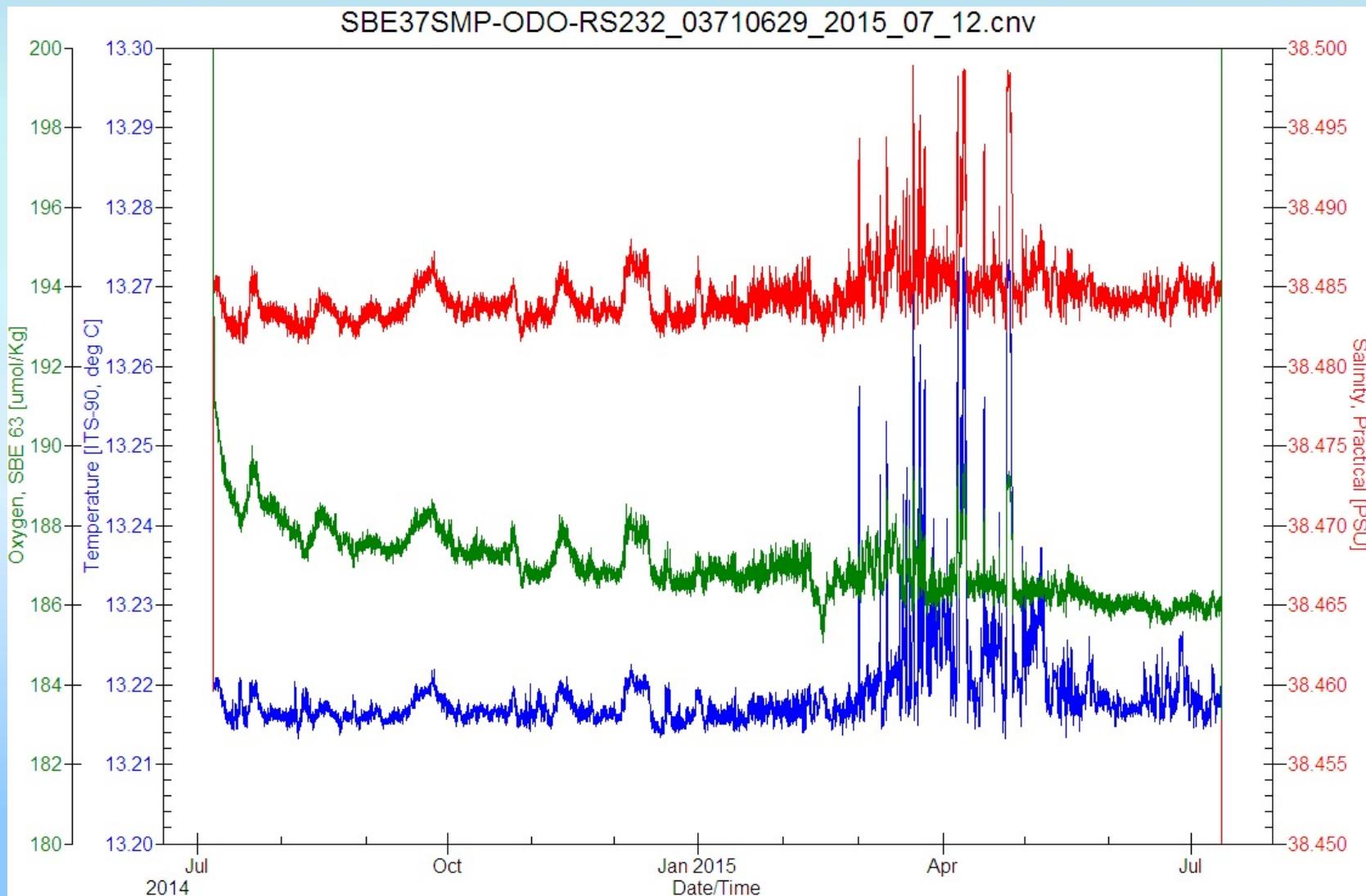
SBE37SMP-ODO-RS232_03710757_2015_07_12.cnv



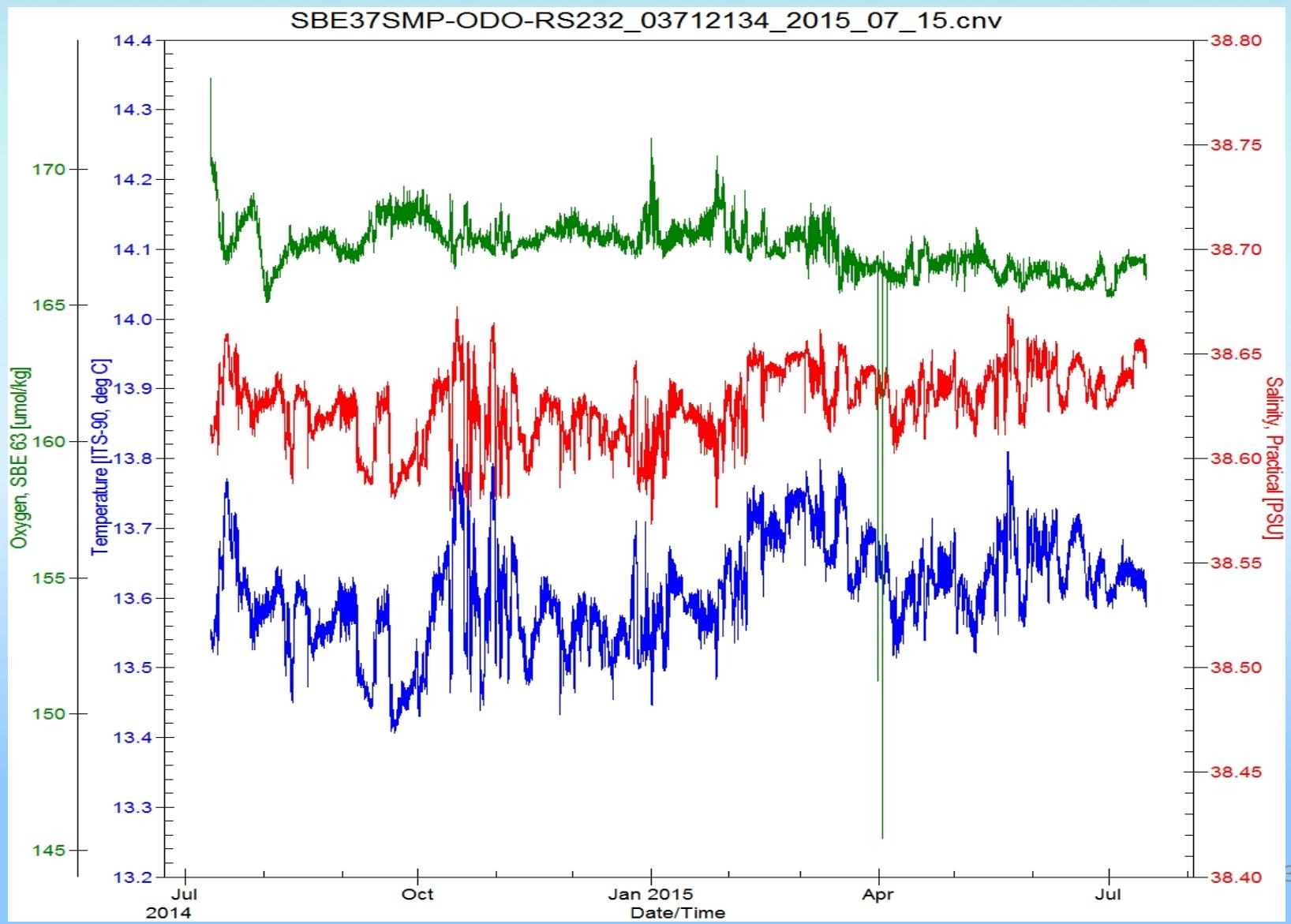
LION 2000m

<TAU20>4.000000e+00</TAU20>

<NTAU>1.000000e+00</NTAU>

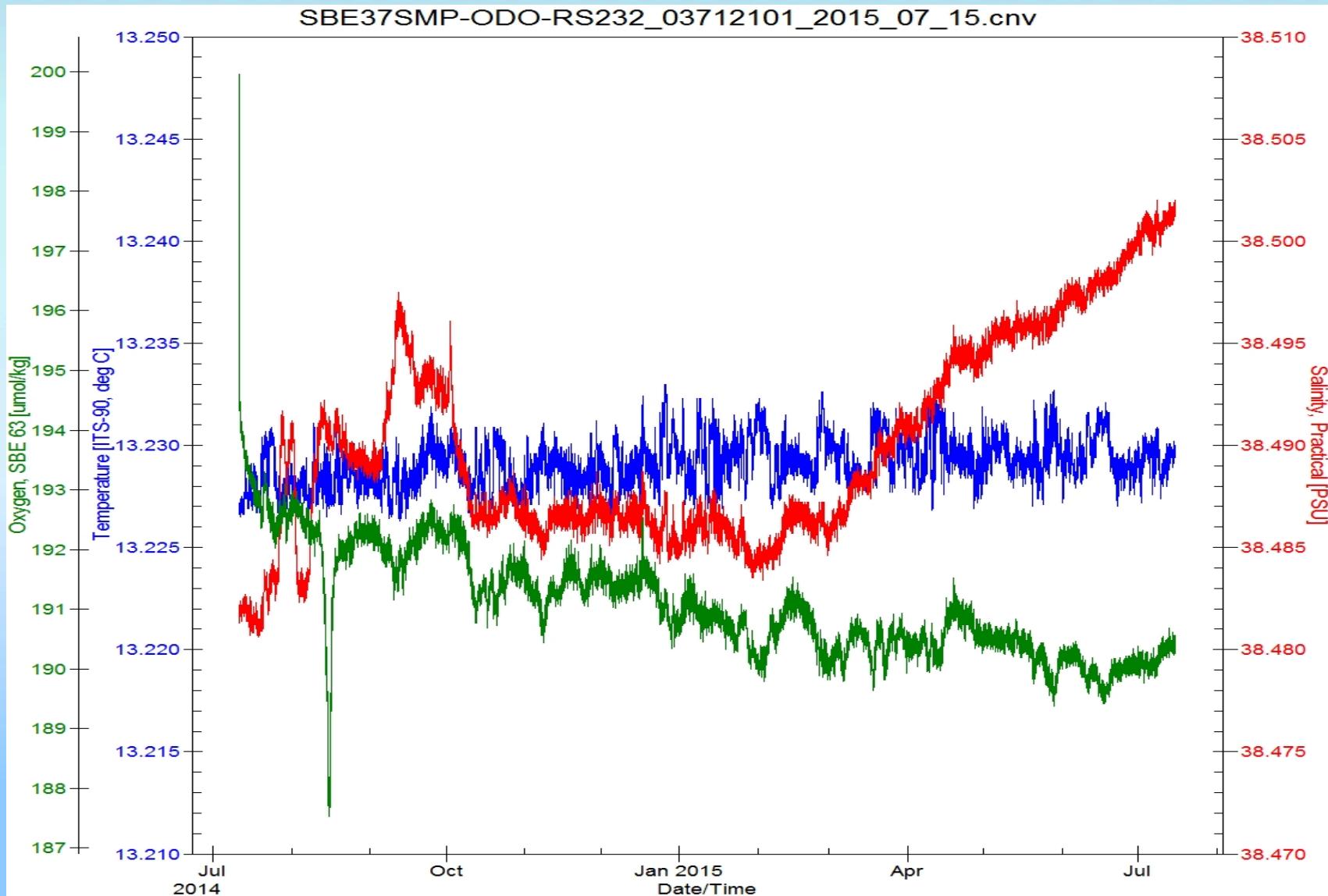


DYFAMED 350 m



DYFAMED 2000 m

<TAU20>5.000000e+00</TAU20>
<NTAU>4.000000e+00</NTAU>



Pre/post Deployment setup

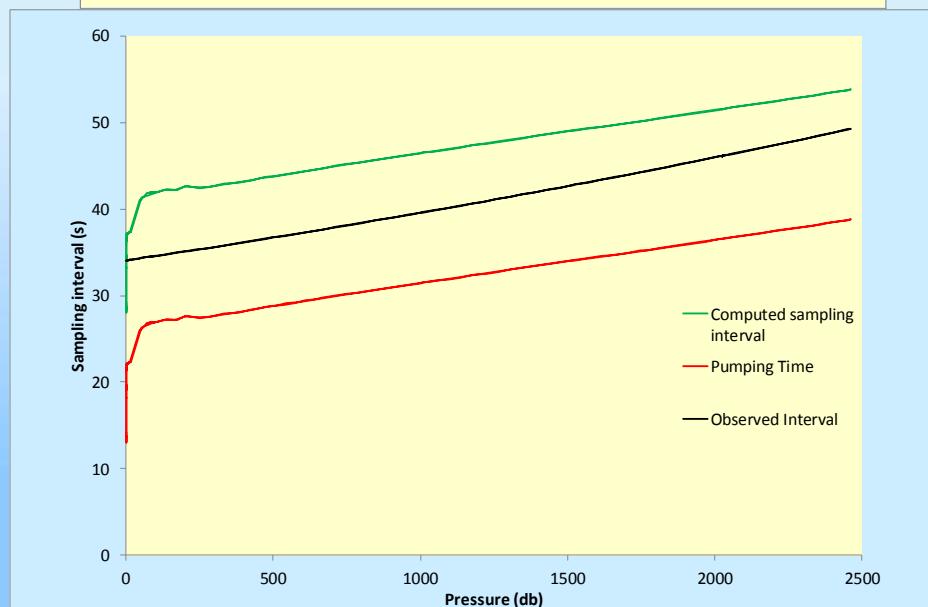
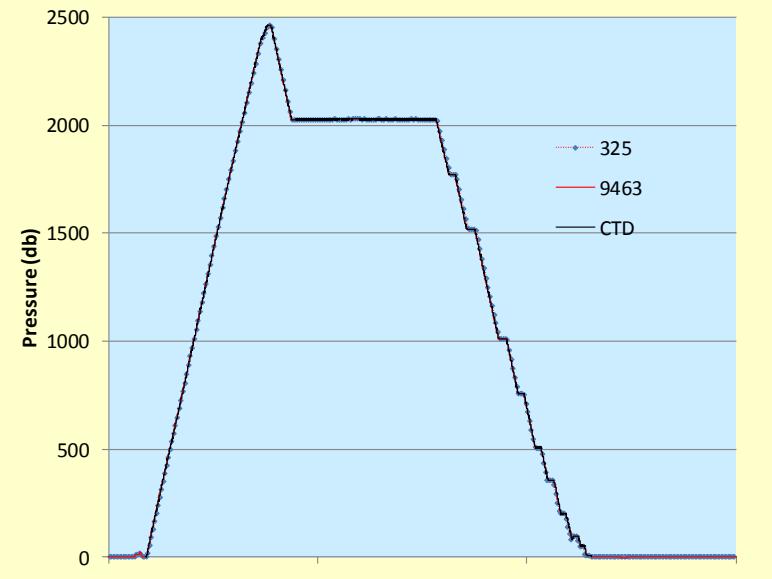
Data acquisition CTD

Sensors @ 2 depths (5 and 2000 m)

30-45 mins



Microcat mounted on CTD caroussel

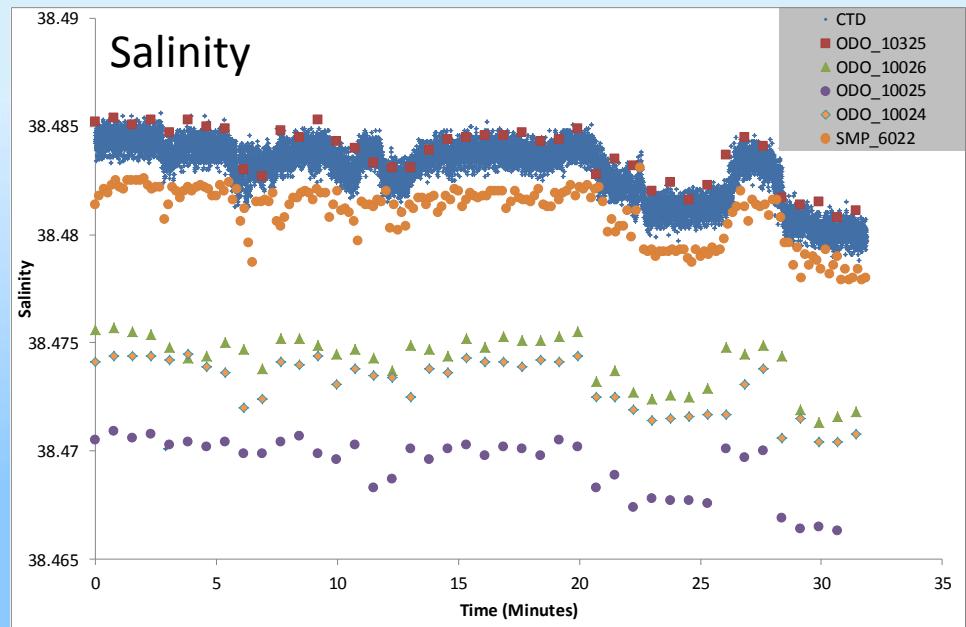
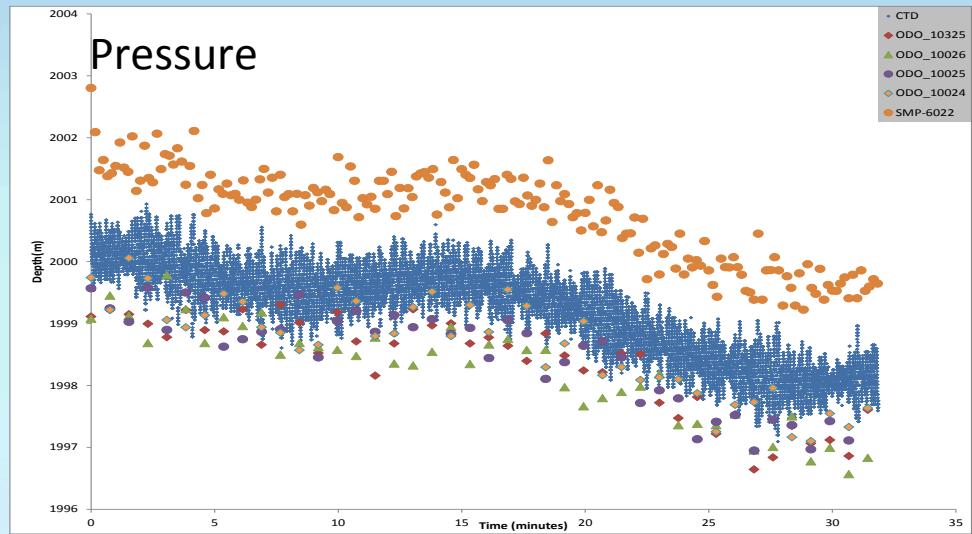


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