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**OXYGEN CORRECTION**  
**OF OVIDE ARGO DATA**  
**FLOAT WMO 5902301**

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Reference : Internal report **LOPS/17-27**



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# OXYGEN CORRECTION OF OVIDE ARGO DATA

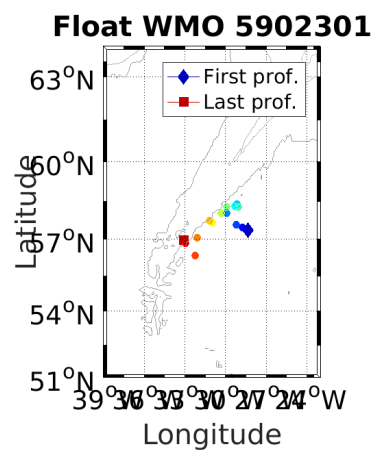
## FLOAT WMO 5902301

### Internal Report LOPS/17-27

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The Delayed mode Quality Control for Salinity and Temperature report is archived (bilan\_5902301.pdf).

# 1 Oxygen correction with LOCODOX

Number	Deployment (cycle OD) cycle OD	Last cycle 14
Provov WMO 5902301	25/06/2010 0h57	
CTS3-DO 9	N 57.3791 W 28.18635	
Date of Oxygen control	Float status	Last cycle
September 2017	DEAD	14/11/2010
Coriolis transmission		27/09/2017

Table 1: Status of the float

This software is used to correct Oxygen data (parameter DOXY) contained in the files BR(real time) and/or BD(Delayed Mode) associated to files R (Real Time T/S) and/or D(Delayed Mode T/S).

**PI suggests :** The Oxygen corrections have been done only when Salinity and Temperature were available in Delayed Mode (D files). Theoretically, the corrections should be done from adjusted values (TEMP and PSAL). However, when there is a few bad values in salinity (of about few tens of PSU), and if there is no bias in salinity (OW method), PSAL data can be used instead of PSAL\_ADJUSTED, because the impact of those values on the oxygen correction is not significant.

To correct Oxygen data, LOCODOX software gives 3 choices to work :

- from a reference profile
- from WOA climatology
- from in air measurements

**The reference profile for this float is the station 63 of Ovide 2010 cruise.**

LOPS options are :

Options	Choice
Unit DOXY	Mumol/kg
Suppress hooks	YES
Drift correction with	PRES
Vertical scale	PRES
Apply drift correction	NO
Correction using : PSAT/DOXY	PSAT
kind of error	RELATIVE
OFFSET	2.37

Table 2: LOCODOX Options

## Applied DOXY correction

$PSAT=f(DOXY)$ ;  $PSAT\_ADJUSTED=A*PSAT+B$ ;  $DOXY\_ADJUSTED=f(PSAT\_ADJUSTED)$   
with  $A=1.072$ ;  $B=0.084$

Percent saturation corrected as a linear function of PSAT; Comparison to a single reference profile (isobaric match as in Takeshita et al. (2013)) on cycle 1; PSAT converted from DOXY and DOXY\_ADJUSTED converted from PSAT\_ADJUSTED.

There is no QC flag superior to 2 in Pressure, Temperature and Salinity, so there is no QC controls plot. There is no bias in salinity for this float, so the DOXY correction has been done with PSAL.

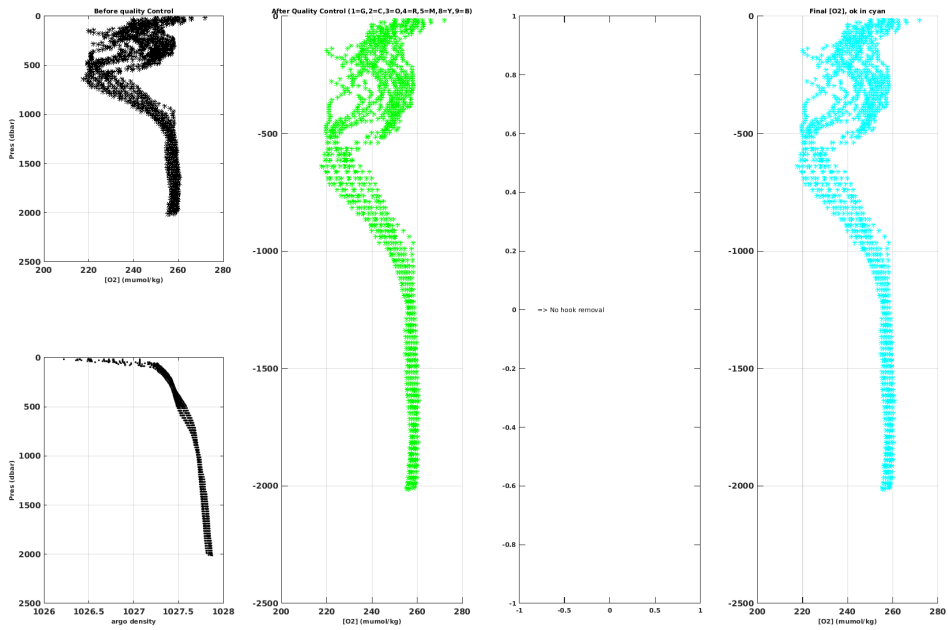


Figure 1: The first 50 meters from the bottom are suppressed because data are uncertain; Only data in cyan are taken for the correction.

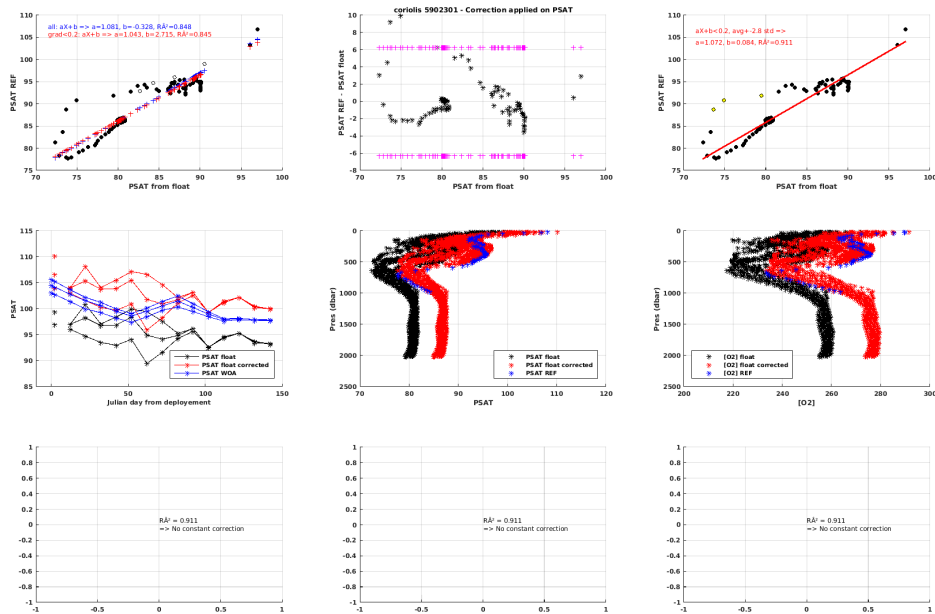


Figure 2: Plots produced by LOCODOX

Float 5902301 was corrected based on a comparison of the first ascending profile of the float with an in situ reference profile acquired at float deployment. The correction is done in considering the percentage of saturation (PSAT).

**Upper panels :** The three panels show the regression between the Argo profile and the reference profile.

**Middle left panels :** PSAT in the upper 10m from the raw data (black curve) and the corrected data (red curves). PSAT estimated from the World Ocean Atlas at the float position is also provided for comparison (blue curves).

**Middle center panel :** PSAT values from the raw data (black curves), the adjusted data (red curves) and the reference profile (blue curve).

**Middle right panel :** Same as the center panel but for dissolved oxygen concentration value (DOXY et DOXY\_ADJUSTED) in mumol/kg.

**Lower panels :** Same as the middle panels but when LOCODOX proposes a constant correction.

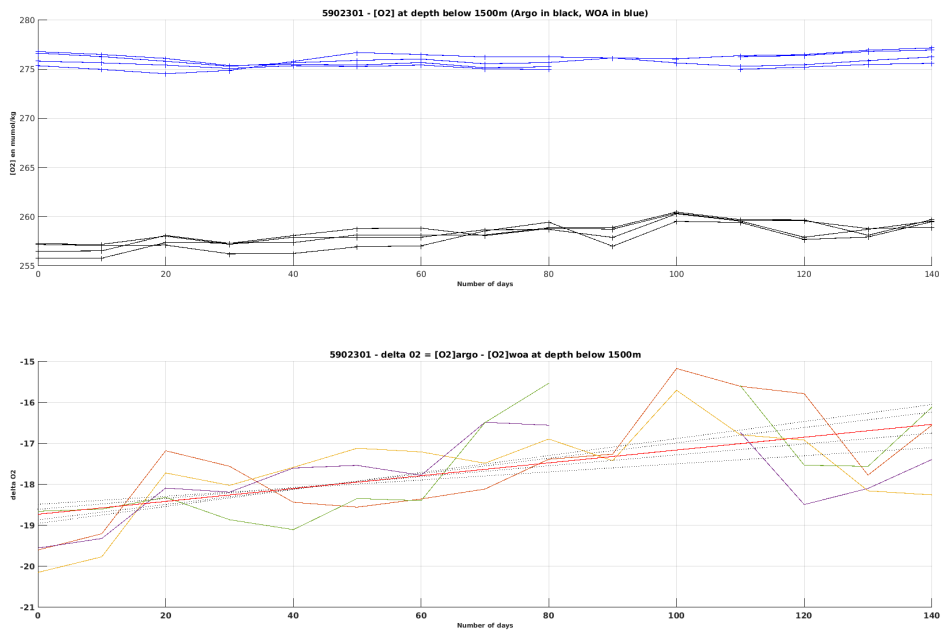


Figure 3: Comparison in the deeper levels (below 1500m) between the float data and WOA data interpolated at the float position (horizontal and vertical). The temporal evolution of the difference is used to estimate a possible sensor drift.

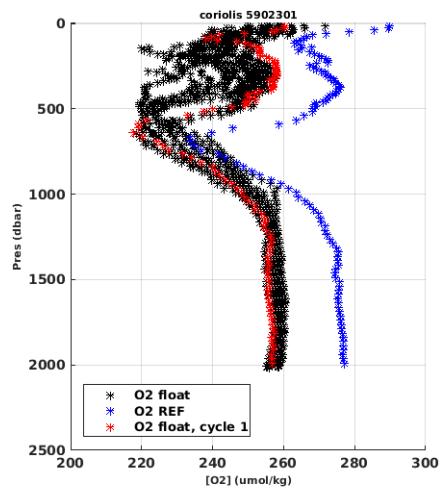


Figure 4: Profiles float 5902301 (black), O2 hydro reference (blue), O2 float cycle 1 (red)

## 1.1 Corrected data float

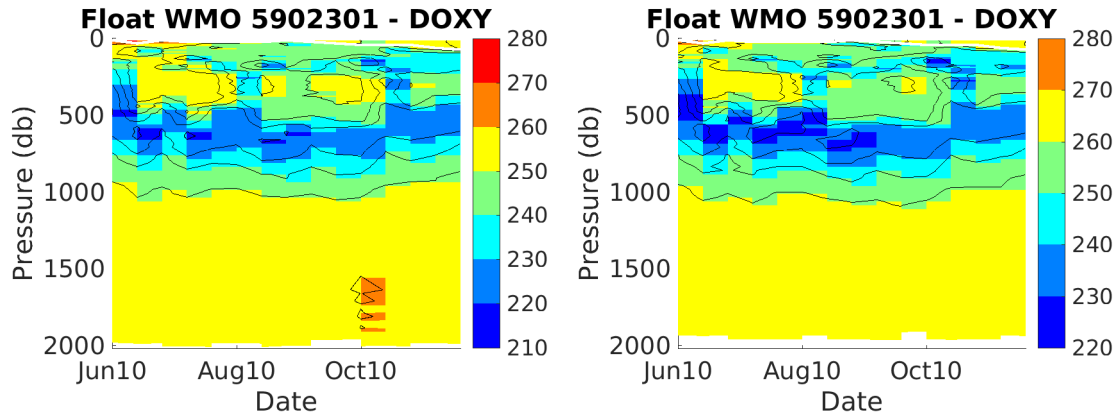


Figure 5: Oxygen section along the float trajectory (interpolated on standard levels). Quality flags are taken into account. Left plot: Raw data - Right plot : corrected data

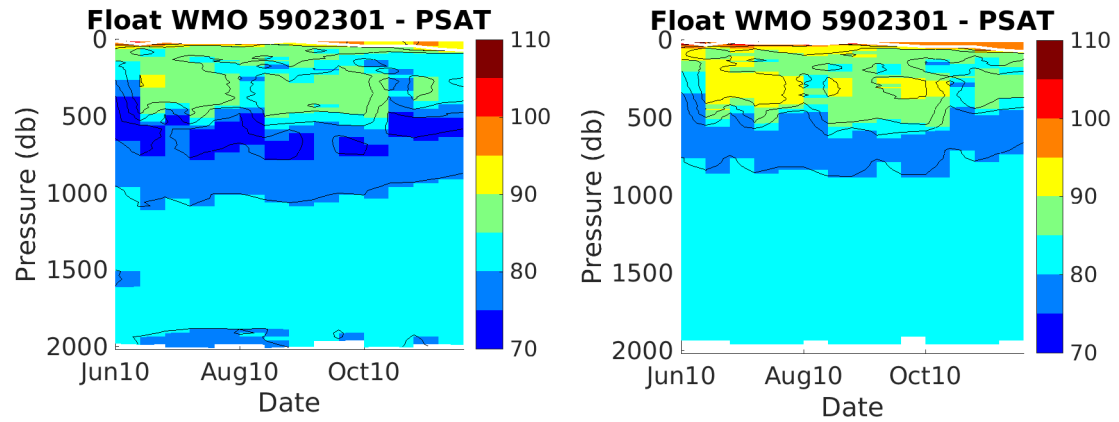


Figure 6: PSAT section along the float trajectory (interpolated on standard levels). Quality flags are taken into account. Left plot: Raw data - Right plot : corrected data



## 1.2 Examples of corrected profiles with LOCODOX

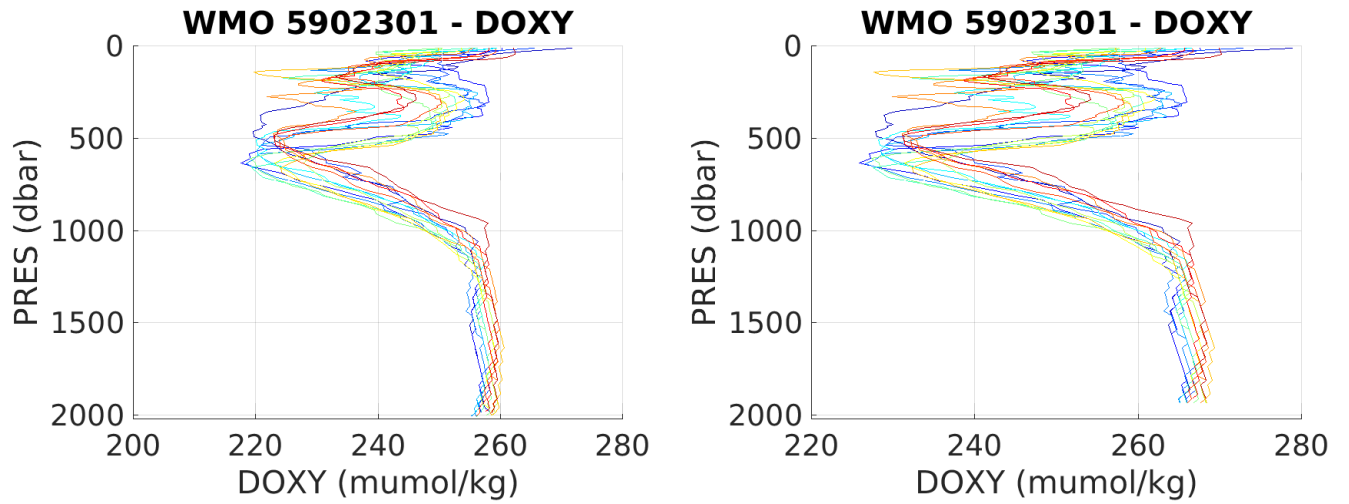


Figure 7: Oxygen profiles. Left plot: Raw data - Right plot : corrected data

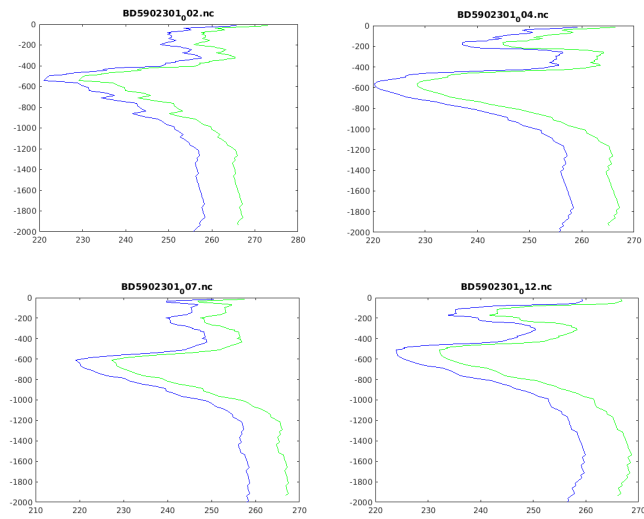


Figure 8: Float 5902301 : Corrected profiles in green.