



Float 6901865 oxygen data calibration

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Sommario

Introduction	3
Float oxygen calibration	4
Discussion	5
References	5

Introduction

Following the procedure reported in Gerin et al., 2020, the float 6901865 was calibrated using its profile number 2 (data from /ifremer/argo/dac/coriolis/6903***/profiles) and the Winkler samples took at station 44 D on 19/02/2014 obtained during the ADREX 2014 oceanographic survey (Fig. 1).

Distribution of Winkler stations and Argo float (6901865) vertical profiles

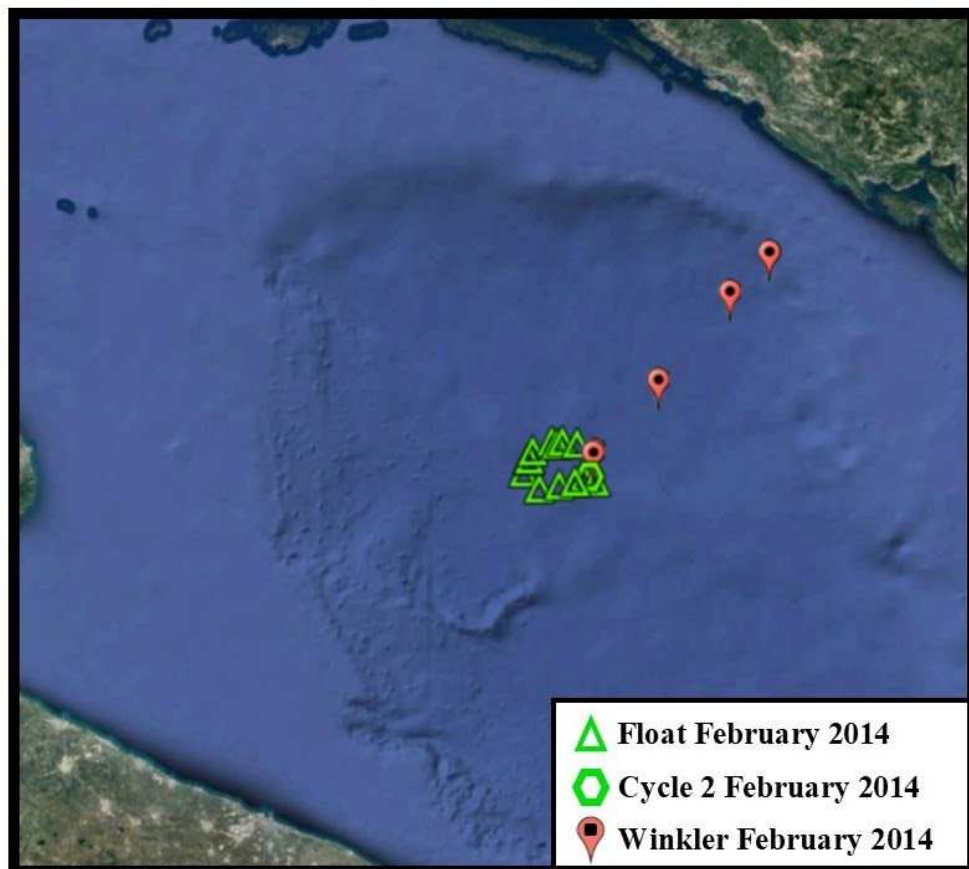


Fig. 1: ADREX-14 cruise stations with Winkler samples during February 2014 (red symbols) and float 6901865 profile positions in the same period (green symbols). The green hexagon indicates the float profile chosen for the comparison.

The selected profile (profile 2) of float 6901865 was collected the day after the Winkler sample (at station 44D; ADREX 14 cruise) at about 1 km of distance (Tab 1).

Floats						Winkler						Distance	
WMO	Cycle	Date	Time	Latitude	Longitude	Cruise	Station	Date	Time	Latitude	Longitude	(km)	(hours)
6901865	2	19/02/2014	11:38	41.838	17.744	ADREX 14	44D	18/02/2014	07:52	41.842	17.756	1	20

Table 1: Float profiles and Winkler samples time and distance gaps of the associated case. Table reports also the float profile and Winkler samples time, position and cycle (profile) or station number.

Float oxygen calibration

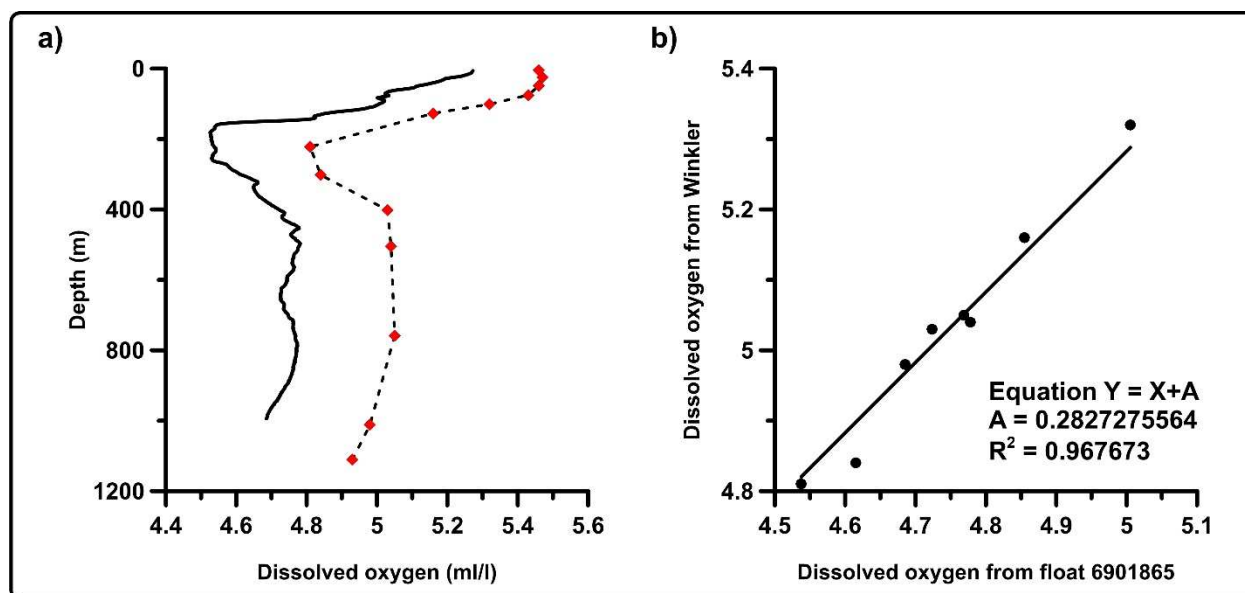


Fig. 2: Comparison between Winkler data (red diamonds) and float (black line) oxygen profile for the selected case.

The oxygen graphs of the selected float profile and Winkler samples are very similar in shape and the least square minimization displays a very high coefficient of determination (0.96) and an underestimation of the float oxygen data of about 0.3 ml/l (Fig. 2).

Discussion

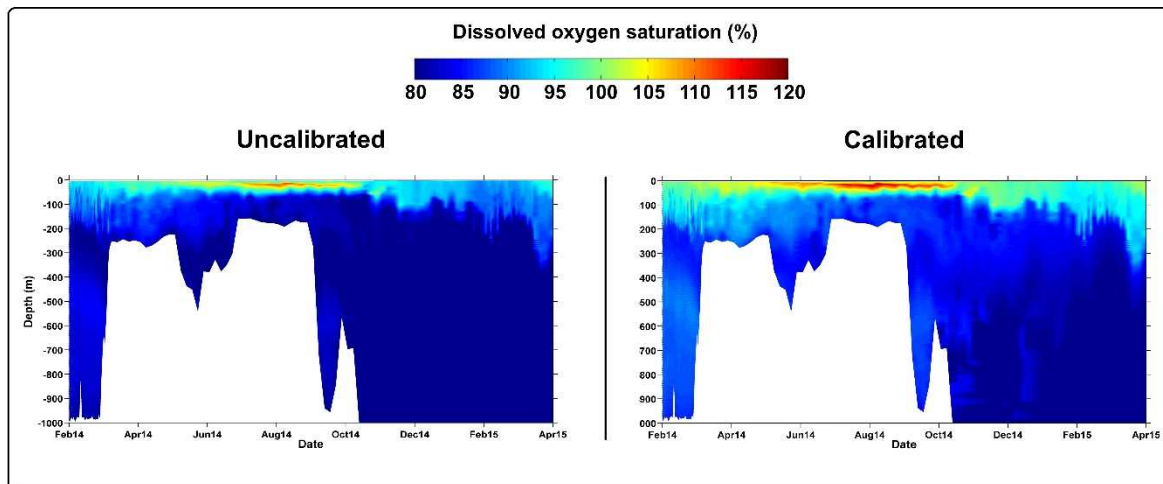


Fig. 3: Hovmöller diagram of dissolved oxygen saturation (%) for uncalibrated (left) and calibrated float (right).

The Winkler samples collected during the ADREX 14 cruises was used to calibrate the oxygen data measured by Argo float 6901865 in the SAP following the procedure reported in Gerin et al., 2020.

To further evaluate the quality of the calibrated oxygen data, the oxygen saturation before and after the calibration was computed and compared (Fig.3). The surface values of the dissolved oxygen saturation clearly indicate that, before the calibration, the saturation is too low as already observed by Gerin et al., 2020 for other floats in the same area.

Repository of the calibrated oxygen data

The calibrated float oxygen data were organized in a matrix (time, depth, calibrated oxygen) which includes all the float profiles. Data were saved in matlab format at the OGS Cayman server (storage/sire/dati/float/data/coriolis_profiles/6901865).

References

Gerin R., Martellucci R., Notarstefano G. and Mauri E. (2020). Float oxygen data calibration with discrete Winkler samples in the South Adriatic Sea. REL. 2020/30 OCE 9 MAOS, Trieste, Italy, 21 pp.