

GOS2024001014: Dissolved Oxygen calibration

Nine water samples (of which 2 x 2 doubles) for oxygen calibration were collected at two stations during the cruise: Thatio M26 in Masfjorden and station M04 in Fensfjorden, see Table 1. Sampling was carried out by Francesco Saltalamacchia, BIO, UiB and the samples were analyzed by K. Jackson-Misje, GFI, UiB after the cruise.

Table 1: Water samples collected during cruise GOS2024001014

Station – name	Station – number	Depth	Niskin
M26	519	Bottom	1
		Bottom	1
		400	2
		350	3
		200	4
M04	520	Bunn	1
		Bunn	1
		500	2
		200	3

Oxygen concentrations observed by the CTD and those determined through Winkler titration were converted to [$\mu\text{mol/kg}$] and compared. For the doubles, the difference between the two samples (samples taken from the same depth, station and Niskin) was lower than 3 $\mu\text{mol/kg}$, and the mean value was retained.

A total of seven samples/values were included in the analysis.

We fitted a line to the data using linear regression, and samples with an error larger than 2.5 times the root mean square error were removed. This procedure was repeated until no more samples were removed or the root mean square error of the remaining samples was smaller than 2 $\mu\text{mol/kg}$.

All seven samples were included in the final regression (Figure 1) used to correct the DO-profiles collected with the CTD (in $\mu\text{mol/kg}$):

$$DO_{corrected} = 1.0423 DO_{CTD} + 2.5$$

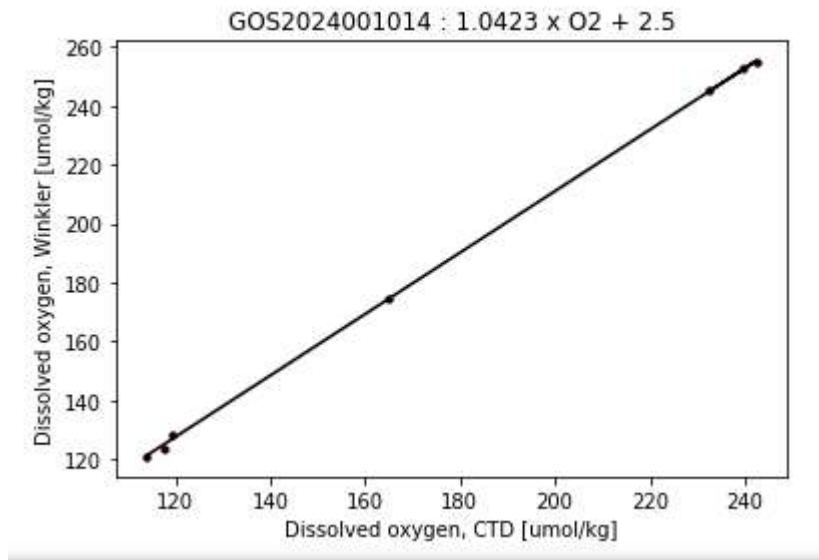


Figure 1: Dissolved oxygen concentration observed with the CTD versus that determined through Winkler titration. The black line shows the regression line used to correct the CTD data, and the black (red) dots are the samples included (not included) in the final regression analysis.

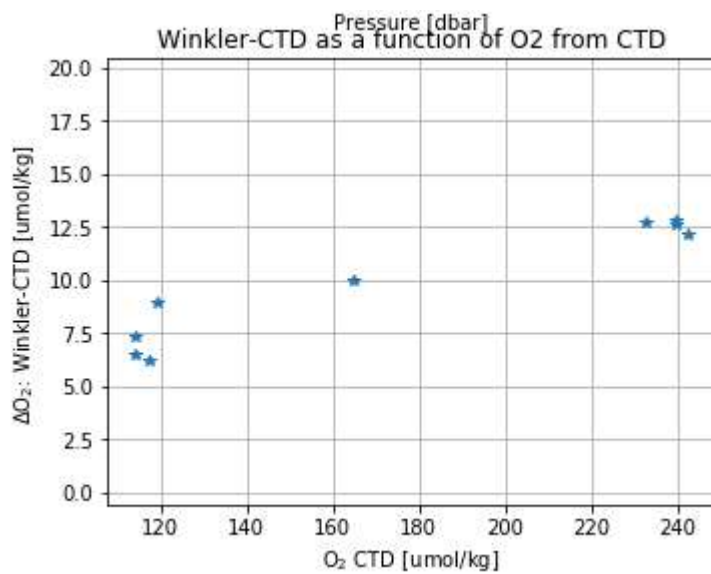


Figure 2: Offset between CTD and Winkler as a function of the dissolved oxygen concentration observed by CTD.