KB2022623: Dissolved Oxygen calibration

Oxygen concentrations observed by the CTD and those determined through Winkler titration were converted to [umol/kg] and compared. One obvious outlier was flagged (i.e., removed from further analysis).

When the difference between doubles (samples taken from the same depth and station, but not necessarily the same Niskin) was lower than 3 umol/kg, the mean value was retained. If the value was higher than 3 umol/kg both samples were removed. Four double samples were merged.

Samples collected shallower from depths than 50 m were removed.

A total of 16 samples 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 umol/kg.

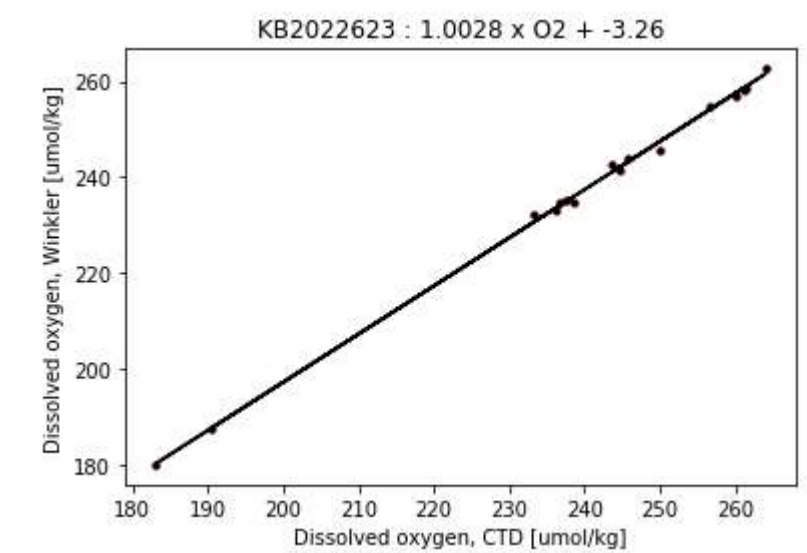A total of 16 samples were included in the final regression (Figure 1).

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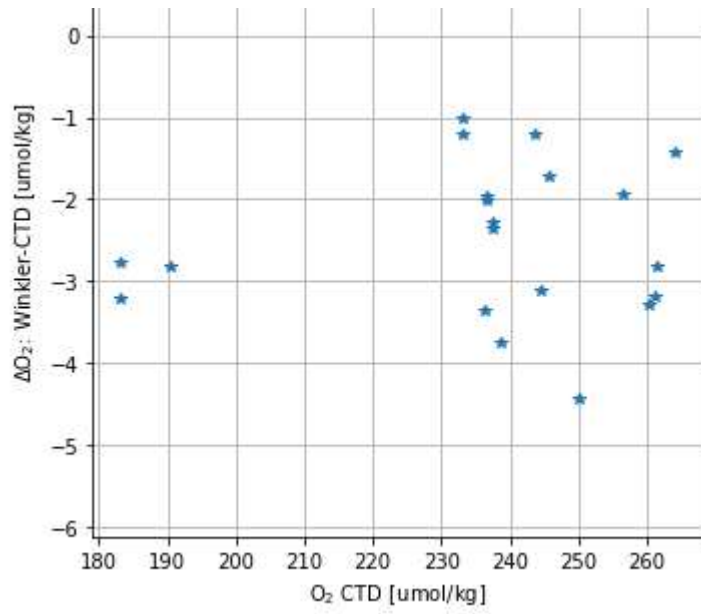
Figure 2: Offset between CTD and Winkler as a function of the dissolved oxygen concentration observed by CTD.