

Interactive comment on “Stable carbon isotopes of dissolved inorganic carbon for a zonal transect across the subpolar North Atlantic Ocean in summer 2014” by Matthew P. Humphreys et al.

Anonymous Referee #1

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Review of - Stable carbon Isotopes of dissolved inorganic carbon for zonal transect across the Subpolar North Atlantic Ocean in summer 2014 - by Humphreys et al.

This study aims to present a new data set of $d_{13}CDIC$ recently collected in the water column of the Subpolar North Atlantic Ocean, partly documented until now. Details of sampling, measurements and data processing to get a consistent $d_{13}CDIC$ data set in open access are thus given by authors. Regarding previous studies, the particularity of this paper lies in the use of seawater reference material (RM), produced by A. G. Dickson, during sample analysis to calibrate measurements, like for DIC and Alkalinity. Method and statistical analysis of their measurement precisions with this material and compared to their previous work (Humphreys et al., 2015a) are also explained in

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detail. Results are solid and persuasive to support development and introduction of such material during d13C samples analysis to enhance data quality and standardize international data sets. d13CDIC is in fact an useful parameter to constraint Cant budget but the Suess effect extract from this parameter is very small and need to reduce precision. In my opinion, this study could be accepted as is. I have just two minor comments to improve understanding.

Minor Comments: Part 4.2.1 : “Calibrated range” and “5 mV s” ; 1/ Could you clarify the “Calibrated range”? What is it? How you determine it? You speak about a range, why have you only a low value as reference to remove bad measurements.

2/ I am confused by unit mV s whose “s” becomes mixed up with text: Either it is a mistake (mV/s) or it is comparable with mWb (milliwerber), unit of universal system.

Part 4.3.2 : Cross over Analysis; 1/ Use cross over analysis to validate your data set is very good. I am in agreement with you to remove data over 200m depth to remove the seasonal variability due to biological activity and ocean dynamics. However, I am not agree to apply this method on data sets sampled with an 11 years interval in this region where anthropogenic signal is detected up to the bottom. Although the suess effect is probably small and your results (differences observed between both data sets) are included in your data uncertainties, I think it is important to include this information in the full text in order to keep in mind for future comparison. 2/ Could you add cross over cruises position on one figure to report their spatial distribution?

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