Referee 2

We thank the referee for a very constructive and helpful review. Below, we detail how each referee comment has been addressed and how the manuscript has been modified accordingly.

Manuscript structure
As suggested by both referees, we have tried to re-structure the manuscript to enable better flow. Five tables have been moved to a new Appendix B and Figure 12 has been moved to the Materials and methods section together with associated text. In addition, the Introduction (Sect. 1) has been organized into four sub-sections, mainly to put more emphasis on the definition of Atlantic water for transport calculation.

In the following, we address specific comments from Referee 2 where quoted text from the old or the new version of the manuscript is in *italic.*

Referee: The manuscript is however very technical with several analysis and many correlations are presented. The manuscript will benefit from moving some of these analysis/tables to supplementary material or to an appendix. This will make it easier for the reader to follow the steps and analysis.
Reply: Five of the tables have been moved to a new Appendix B. Also, Fig. 12 and associated text has been moved to Sect. 2.1.

Major comment

Referee: The transport estimates are calculated by integration the velocities down to the depth where T=4 ^{o}C that they define as the base of the Atlantic layer. However, the properties of the AW change with time (e.g., fig 15b), and the authors should give some estimates of the sensitivity of results if other depths are used as the lower limit. E.g., what will the transport estimates be when using T=3 ^{o}C or T=5 ^{o}C as the lower limit of the depth integration.
Reply: The discussion of Atlantic water in the Introduction has been enhanced to include the sensitivity and the effect of changing AW properties. In connection with this, the Introduction has been split into four subsections, for emphasis, with the discussion of Atlantic water as Sect. 1.3.

Minor comments

Referee: Is table 1 needed? Fig. 2. shows the bottom depth of the area/stations and it is already written that the CTD-stations are taken 3-4 times a year. If deleted, the sentence on lines 146-147 can also be deleted.
Reply: Table 1 has been moved to the new Appendix B.

Referee: Line 211-212: "… the extrapolation factor **may be** modified to account for these." Please, specify. Was this done?
Reply: "*may be modified*" has been changed to: "*was modified*"

Referee: Figure 6. It would be interesting to see the variance of the cross-ridge velocities for the four ADCPs, e.g., include standard deviation in the figure.
Reply: A graph showing standard deviation has been added (new Fig. 7b) as well as a sentence referring to it in the text.

Referee: Line 371: "They document that…" Who are **they**?
Reply: The words "*They document*" have been replaced by "*This implies*".

Referee: Line 405-413. With the regression analysis for u=a*dH+b, the values a will determine the strength of the variability while b determines the bias. Thus, it is the **variability** of the surface velocity that is underestimated.
Reply: We have added a sentence: "*This might be due to a large bias, b in Eq. (3), for this site but inspection of individual daily velocity profiles does not support that (Fig. 9 in Hansen et al., 2018).*"

Referee: Line 439-440: According to Figure 6, zero velocity are not reached at several ADCP-locations. Is the vertical integration done to bottom when the velocity does not reach zero?
Reply: The sentence before Eq. (7) has been changed to: "*Sites IA, IB, and IE have inflow throughout the water column, on average (Fig. 7a), and the integration is down to the bottom. For site IW, we only integrate down to the depth, $z = z_0$, where the average cross-ridge velocity becomes zero:*"

Referee: Table 7. The mean values of D_{eq} and L_{eq} are presented but I assume that there might be large temporal variation. If standard deviations or errors can be included, this will give some indications on the sensitivity of the method.
Reply: For ADCP site IW, we now write: "L_{Eq} *= (12 ± 4) km, where the uncertainty is determined by the uncertainty of* α_{Reg}". For the other sites on the IFR, we write: "*For these sites, the relative uncertainty of* L_{Eq} *is higher (between 38 % and 75 %), and* L_{Eq} *has been set equal to the interval width, L.*". For D_{Eq}, we could not find any objective way to derive any uncertainty estimate. We have, however, added a sentence to Sect. 7.4 (old line number 832): "*Also, the many uncertainties involved make the numbers in the bottom row of Table 4 rough estimates*."

Referee: Figure 11. Is the altimetric offset calculated from the averaged surface velocities from ADCPs?
Reply: The caption for Fig. 11 (new Fig. 12) has been clarified by the following text: **"***Optimized values for the Altimetric offset,* U_k^0*, in each altimetry interval are shown by the thick continuous red line. The value for* U_2^0 *is based on ADCP NI (Table B2).* U_3^0 *and* U_4^0 *are based on linear combinations of surface velocities from two or three ADCPs (Sect. 3).* U_5^0 *and* U_6^0 *are combined estimates from NC and NH (Table B2) and the geostrophic method.* U_7^0 *is based on the geostrophic method."*

Referee: Line 532: Please include a reference for the depth of AW = 4 ^{o}C.
Reply: We now refer to the new Sect. 1.3.

Referee: Line 573: see my comment on Line 532.
Reply: We now refer to the new Sect. 1.3.

Referee: Line 772: "… surface AND deeper…"
Reply: Has been corrected

Referee: Line 776: See my major comment.
Reply: Hopefully, the new Sect. 1.3 with information on Atlantic water clarifies here.
Appendix

Referee: Eq. A1: why 500 m? Why not use depth of the Atlantic layer or bottom depth?
Reply: Our reason for doing this is that the deep boundary of the Atlantic layer is in general sloping. This was not well explained, however, so now the following text has been inserted before Eq. (A1): "*Within each altimetry interval, k (spanning A_k–A_{k+1}), $U_k(z,t)$ is the eastward velocity at depth z and time t, horizontally averaged within the interval. The contribution to Q(t) from this interval is found by integrating (summing) the velocity down to the deep boundary of the Atlantic layer (bottom or 4 °C isotherm) and multiplying by the interval width. The deep boundary is, however, in general not horizontal. To account for this, we introduce a parameter $W_k(z,t)$, which is the width of Atlantic water within altimetry interval k at depth z and time t. With this definition, the volume transport is:*". The paragraph after Eq. (A1) has been modified accordingly.