We thank both referees for their continued positive and constructive comments. We have addressed all remaining points. Below are all the reviewer comments and our responses. Revisions in this second updated manuscript are highlighted in red.

RC1:

My only ongoing concern is the gap between pc1 and temperature in Figure 8a and their rationale for it. ... I would suggest they do more to determine the source of this difference. Even if it's just speculative, the authors could suggest other possible reasons for it (if they have any). Otherwise, this is a good, thorough analysis that is worthy of publication. I appreciate the authors' effort to address each of my comments.

Response: In lines 361 to 366, we have suggested another contributory process and made a rough estimate of its contribution. Although probably contributing, it does not seem to dominate.

RC2:

Thank you for the revised version of the manuscript, the clarity of the manuscript has certainly improved. My comments have been addressed well, and I have only minor comments on the revised version that should be quick and easy to address.

Specific comments:
- L131: Is there an updated version available of the product you used? I'm not sure whether it's helpful to state that something is no longer available.

Response: Has been changed to "This product has been replaced by a new product with different resolution."

- L163: More accurately, surface flow is parallel to contours of sea level height.

Response: You are right. Has been changed.

- L320: One of "the two gyres" you refer to is the SPG, is the other one the STG? It'd be good to be explicit here.

Response: Yes. Has been changed accordingly.

- L337: Perhaps state the exact boundaries of the analysis (or refer to the methods, I believe this is the area specified in Section 2.4).

Response: Has been stated.

- L349-352: This part is a bit difficult to follow. If I understand it correctly, you want to say that it is likely that most of the inflowing water has properties in between stations I and V when approaching the ridge, as only those waters that first may have entered the FBC and then approach the IFR (which, as the drifters/Fig. 3 suggest, seems to be only a small portion) could be cooler and fresher than measured at I and V. Perhaps word this in a positive way avoiding too many negations (not entered, less affected) and consider to describe it from the perspective of the main flow (only a small portion would take a detour to the FBC) to improve clarity.

Response: Have tried to write this clearer

- L352: Please state first the result/conclusion of Table 1 (perhaps even before L349-352) before explaining why you think this result is robust/the numbers are not overestimates. (I support your argumentation, but this entire paragraph could be written more clearly.)

Response: The general conclusion and the conclusions from table 1 have been moved to the front.

- Fig. S5 in the supplementary are actually two figures (if you call them panels a and b, they should share the caption). Since it makes sense to show this as one figure, I suggest to combine it and label the panels with a-d for the earlier and e-h for the later period.

Response: Has been done. A new Figure S4 has been added. Therefore, the numbering of the subsequent supplementary figures has been increased by one.

- Fig. S6: The Argo profiles don't look very clean. Perhaps try to smooth them before averaging. Also, label the profiles with Upstream, Flank, Crest as in the other plots.

Response: The uneven appearance of the previous mean profiles was not due to noise in the individual Argo casts, but rather an artifact of the raw data having irregular and different sampling depths. Consequently, the number of profiles contributing to the average varied for

each depth, causing artificial 'steps' and incorrect weighting in the mean profile.

To resolve this, we have now linearly interpolated all raw profiles onto a fixed, regular 1-meter depth grid before averaging. This ensures that every profile contributes equally at every depth. This gives a smoother mean profile, but the profile is also changed due to the right weighting. The labels Upstream, Flank, Crest are now on the plot.

- L417-421: I'd still would say the area with most drifters (Fig. 10b) is the southeastern flank, not the "western flank" (perhaps you just forgot to change it to "flank" only, which would be fine).

Response: Our intention was to distinguish this area from the eastern slope facing the Norwegian Sea. We have changed the term to "upstream flank" (referring to the flank facing the Iceland Basin) to avoid any mixing between the upstream and downstream sides of the ridge.

- Fig. 10/Section 2: Perhaps it'd be useful to specify in the Data and Methods section ("Data" is probably also a better name than "Materials") how you computed EKE for the drifters and from SWOT, including the differences in the averaging period used to define the mean flow and in the temporal sampling used to compute the velocity anomalies.

Response: The chapter name "Materials" is changed to "Data and Methods". We have updated section 2.1 and 2.6 on how the EKE calculations were done.

- Fig. S8: I realised that you haven't explicitly defined overflow water as waters having densities exceeding 27.8 kg/m^3. Is all the cold water really overflow water, or what you call Arctic water? To support your statement, you could consider showing bottom density instead of temperature. Also, perhaps mark Section N and the standard stations with different markers to make it easier to distinguish them from the data points.

Response: We have added a figure S9b showing bottom density and the definition of overflow is added in L464-465.

- Fig. S10: Could you add a horizontal (e.g., dashed) line at 23% KR/77% IB (and perhaps vertical lines at 1995 and 2015)? That would make it easier to justify why you then can call this a "constant ratio" in L482.

Response: We have added the lines and have alter the text to "mean ratio" as we agree that

“constant” is too strong a word in this context.

Technical edits/suggestions:
- L150: remove the full stop before the parenthesis (the sentence ends afterwards).

Response: Has been done

- L155: Perhaps rewrite to “We downloaded all available …” to improve the flow (long sentence before the verb).

Response: Has been done

- L155: “mission’s start”

Response: Has been done

- L193, L207: “the” IFR (to be consistent)

Response: Has been done

- L209, Figure 3a,b: Correct the spelling of “Rockall Trough”.

Response: Has been done

- L339: Remove the comma after “obvious”

Response: Has been done

- L376: Consider changing “place” to “space”

Response: Has been done