Authors replies to the interactive comments of anonymous referee #1 (12 May 2019) on "Seasonal variability of intermediate water masses in the Gulf of Cadiz: implications of the Antarctic and Subarctic seesaw model" by David Roque et al.

RC: denotes referee's comments

AR: denotes authors' reply

RC: Page 1, Title: "Antarctic and Subarctic seesaw model". The reference to a "seesaw model" in the title but nowhere else in the text should be avoided.

AR: Reviewer is right, we have remove the term model from the title.

RC: Page 1, Abstract: The sentence "the seasonal variability for the predominance of these intermediate water masses is explained by a novel model based on the concatenation of several wind-driven processes acting during the different seasons", overrates some- how the importance of the methodology used in this work.

AR: Reviewer is right, we have redrafted these line of the abstract expressing the subject in a more objective fashion.

RC: Page 2, lines 28, 29: Since MW is characterized by low nutrients, its interaction with AAIW, (characterized by high nutrients) can only cause an increment on the MW nutrients (and not the other way around as expressed in the manuscript). In what concerns the dissolved oxygen, as both AAIW and MW have low concentrations, it is not clear how can their interaction increment the AAIW concentration.

AR: Reviewer is right. We have redrafted this part of the text and have removed the phrase referring to this subject. It was a mistake.

RC: Page 7, line 1: in fact, the AAIW penetration in the GoC seems "more accentuated and closer to the African coast" in autumn if we look at the salinity distribution; however, from the oxygen distribution this seems to happen in summer.

AR: Reviewer is right, this part of the text has been corrected accordingly to the reviewer observation.

RC: Page 7, line 3: It is not clear that the monthly distributions shown by the WOA data always agree with the observed data behaviour. Page 7, line 7: Although the oxygen concentration shows the major entrance of the AAIW close to the African coast occurring in November, this is not clear from the salinity distributions.

AR: We have redrafted the text paying more importance to the coincidence as to the oxygen concentration data of WOA data with the observed data. We have added the phrase

"attending to the oxygen concentration distribution, which offers the most marked differences with the other water masses (see table 2)"

RC: Page 7, line 8: ". . .restricted during the spring months". In fact, this is shown only in March by the salinity distribution and only in April by the oxygen distribution.

AR: We have added the text 'only slightly suggested in March by the salinity distribution and in April by the oxygen distribution.'

RC: Page 7, lines 16, 17: the salinity and temperature sections are not discussed in the text but only the oxygen distribution.

AR: As we told in the previous question, we give more confidence to the oxygen distribution than to the salinity distribution as to identified the different intermediate water masses. By these reason salinity distributions are not mentioned.

We have added the text 'Note that salinity and temperature distributions are not helpful to discern between AAIW and SAIW (see table 2).'

RC: Page 7, lines 24-26: The SAIW shows its lowest percentages (less than 10%) in boxes closer to the Iberian coast (from E to I) during autumn, while the highest values are found in winter in these boxes. The ENACW in the closer to coast boxes (G, H) shows its highest values in spring and summer. . .

AR: It has been corrected accordingly to the reviewer suggestions.

RC: Page 9, lines 24, 25: looking at Fig. 11, the referred latitude values, 50◦ and 30◦N, could perhaps be substituted by 48◦ and 36◦?

AR: Reviewer is right. This item has been corrected in the text.

RC: Page 11: this is the only page in the text where NAO is referred as a cause for the N Atlantic gyre' displacements. The rest of the text mentions only seasonal variations of the gyres position. Attention should be made to the fact that NAO is not a seasonal process and so NAO and seasonal effects should not be confused.

AR: Reviewer is right. We have added some lines to better understand this reference.

We have added the text 'While in our case we are not dealing with the NAO variability it is worth noting that the effect on the subtropical gyre dynamics of a positive/negative NAO are fairly similar to the effects that a winter/summer wind forcing produce.'

RC: Page 32: Figure 12 seems to be considered by the authors a good illustration of the processes referred in the text. It shows the seasonal (summer versus winter) displacement of the North Atlantic gyres and the paths of water masses (not all relevant in the text) but there are other depicted processes, like "upwellings", ITCZ displacement (July versus January), which are not even mentioned in the text. I wonder how relevant and helpful this figure is in the present context.

AR: Reviewer is right. Figure 12 is now the figure 1 and it is called in the introduction in order to help the description of the intermediate water circulation in the Atlantic.

RC: Page 1 and following: in the general oceanography literature, the water mass found in the North Atlantic and originating in the Mediterranean basin is called Mediterranean Water (MW)

and not Mediterranean Outflow Water (MOW). In the present manuscript, the acronym MOW is used in the whole text but is MW that appears in the figures (1, 5, 6, 7, 8, and 9).

AR: We have changed in the whole manuscript the MOW denomination by MW as the reviewer suggests.

RC: Page 2, line 23: define what is meant by “upper MOW core”

AR: There is a reference (Ambar and Howe 1979) that we have added in the introduction, which describes the Mediterranean Outflow Water and how it is divided into two cores; the upper and lower.

The rest of minor corrections have been corrected following the reviewer suggestions.