

We deeply thank the reviewers for their careful reading and commenting of our manuscript. We have strived to address their concerns and made numerous modifications of the text and figures. Point by point description of the changes (in blue) is provided below following every comment of the reviewer (in black).

Comments by the reviewers on the Rossby wave section have led us to discover an error in the value we were using for the mode 1 deformation radius at 14°N (50 km instead of 58 km - the gravity phase speed given in Fig 16 was nonetheless correct). This has led to substantial modifications of section 6, figure 8 and figure 14.

Note that without being asked to do so, we have slightly modified our notations and now refer to the depth anomaly for an isotherm, eg., 18°C, as δz_{18} and no longer z_{18} . (see text p. 6 l. 13-15).

Reviewer 1:

While in general the writing is clear and correct, a rather relaxed and somewhat conversational style leads to lengthy text that could be made more terse, with a modicum of effort. Examples include “are quite noisy but the overall impression is that they tend to be more toward the west. . . p7 l24) or “note also that significant small-scale noise results from the sinuosity of the flow past topographic irregularities whose position can thus locally depart from the shelf break, e.g. in relation to standing meanders in the lee of headlands, as noticeable in . . . p13 l10”. Quite so, but it could surely be said more succinctly.

We have made numerous modifications of the text to try to improve its readability.

Specifically, p. 7 l. 24-25, we now say:

“North of 10°N within 5-10° from the West African coast observed zonal velocities are weak and variable but generally oriented westward. This westward tendency is less marked for model velocities.”

p. 13 l. 25-28, we now say: “Note also that standing meanders of the WABC past topographic irregularities can produce substantial excursions of the flow away from the shelfbreak, hence rapid alongshore changes of V_g (see Fig.10; the position of the main capes is indicated in Fig.12).

Figures are inconsistently labelled, some with panels marked by letter, others not. Even when so labelled, the panels are in some cases referred to not by letter but by position.

We have added labels wherever needed (Figs. 1, 7, 9 et 17), modified captions accordingly, and made sure figures are referred to by these labels throughout the manuscript. Labels for Fig. 8 which were already present are now used in the text.

Abstract: p1 l4 “a suite of” is unnecessary l6 “southernmost” rather than “outmost”

We have modified the text as suggested.

Introduction: p2 l5 preferable to refer to “northwest Africa” for generality and to avoid controversy with respect to the internationally disputed borders in the area.

We have modified the text as suggested.

p2 l5 Delete “see geographical and oceanographical”

We have modified the text as suggested.

p2 l9-10 The water mass front and its weakening with depth have been recognized long before the work cited, e.g. Allain (1970), Fraga (1973) and other papers of that period, and more over later years.

The text now reads (p2 l9-10): “At depths greater than ~300 m, northern Atlantic central waters are found further south and the water mass contrast fades away (e.g., Fraga,1974; Tomczak, 1981; Pena-Izquierdo, 2015).

P4 l19 “literature” not “litterature”

This has been corrected as well as at line 10.

Model evaluation: p7 l16 Figure 6 is called out of order, before Figure 3.

Figures have been reordered such that Fig 6 is now Fig 3.

p8 ll5-12 The doming structure on the zonal line in Fig 2 is weaker in the model. The localized uplift at almost all levels near coast is not mentioned. Incidentally although the figure panels are labelled a-d, the legend refers to left, right, top and bottom.

We agree that the doming structure on the zonal line is weaker in the model. This is why the text mentioned (and still does at p. 8 l. 8) “... albeit with less amplitude than found in the observations.” The legend of new Fig. 3 now uses the labels of the panels.

Seasonal cycle of the WABC: p10 l10 State “Alongslope vertical sections of ...” to emphasize the difference with Figure 7. p10 l11 “across-shore averaging” would be better expressed as “across-slope averaging” as the shore bounds the flow. This occurs in a few other places in the text.

We have modified the text and used “slope” in every instance where it was more accurate than “shore” (where indicated by the reviewer - p. 10 l. 21-22 and also p. 7. l. 6, p13 l. 6 and 8).

WABC coastal dynamics: p11 l10 “as more classically estimated” - does this mean calculated from the observations? If so, please state it more directly.

We meant to refer to the lower bound frequently chosen to compute Sverdrup transport in previous studies. We now say (p. 11. l. 19-20) “as more commonly estimated in past studies” and cite Marchesiello et al, 2003 and Small et al, 2015 (which were already part of the reference list).

P12 l15 Delete “it” before “as occurs”.

We have modified the text as suggested.