

Interactive comment on “On the meridional ageostrophic transport in the tropical Atlantic” by Yao Fu et al.

Anonymous Referee #1

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In this study two cross-basin hydrographic sections closing the Atlantic at 14.5°N and 11°S are used to study the meridional ageostrophic, Ekman and heat and salt transports in the first 300m of the water column. This objective is assessed through hydrographic data (uCTD, CTD, ADCP and TSG), together with in situ winds and wind products (ASCAT, ECMWF and NCEP) and model outputs (GECCO2).

The manuscript is very well written, is well structured, clear, detailed and provides with interesting results of the surface layer. I strongly recommend its publication, after some minor changes.

Major changes: Page 19 lines 11-16 and Figure 5. The three wind datasets presents a high agreement between them, with the exception of the westernmost side of 14.5°N, which suggest that the difference in this area cannot be explained by the different drag

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coefficient formulation. I believe the source of the difference between winds observed in the western side of the northern transect is linked with some local effect. For example, in other areas, such as the Canary Islands, the QuikScat and NCEP data does not resolve the Von Karman structures that are shed from interactions of the flow with the islands as consequence of a low-resolution topography (e.g. Mason et al. 2011, Pérez-Hernández et al. 2015).

Page 19. How is the uncertainty of the Ekman transport estimated?

Minor changes: Page 3, equation 2. Reading from line 15 to line 19, I understand that equation 2 should be $V_{ageos} = V_{obs} - V_{geos} - V_{ageos} Ekman$.

Figure 2, Beware that two subplots have been label as (d)

Page 13. In the paragraphs in between lines 6 and 24, could cite Figure 3 or 4 when defining the mean TTP and MLD depths, and same for the respective paragraph on the 11°S section.

References used: Mason, E., F. Colas, J. Molemaker, A. Shchepetkin, C. Troupin, J. McWilliams, and P. Sangra (2011), Seasonal variability of the Canary Current: A numerical study, *J. Geophys. Res.*, 116, C06001, doi:10.1029/2010JC006665. Pérez-Hernández, M. D., G. D. McCarthy, P. Vélez-Belchí, D. A. Smeed, E. Fraile-Nuez, and A. Hernández-Guerra (2015), The Canary Basin contribution to the seasonal cycle of the Atlantic Meridional Overturning Circulation at 268N, *J. Geophys. Res. Oceans*, 120, doi:10.1002/2015JC010969.

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C2