

Interactive comment on “The flow field of the upper hypoxic Eastern Tropical North Atlantic oxygen minimum zone” by L. Stramma et al.

Anonymous Referee #1

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This manuscript describes the horizontal circulation in the eastern tropical North Atlantic, focusing on the upper (~300–400 m) oxygen minimum zone region south of the Cape Verde islands. The analysis uses a unique collection of observations from CTD, oxygen, and ADCP measurements during several cruises, profiling floats equipped with oxygen sensors, a tracer release experiment, as well as satellite data and an ocean reanalysis. This is an important set of results, particularly the combined view of the circulation from floats, ADCP measurements, and tracer concentrations. I recommend publication, but have several comments for the authors to consider first.

At the end of the Introduction, it would be helpful to have a couple of sentences summarizing what is new about this study. There have been many cruises along 23W that have measured currents and oxygen concentration, but presumably this is the first,

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or most comprehensive, to describe the two-dimensional circulation at the depth of the oxygen minimum zone from direct measurements. Also, the last paragraph of the Introduction is very long and difficult to follow, so I recommend splitting up into two sentences.

In section 4, it would be helpful to know what the key new/different results are. Which of your results confirm previous estimates of the circulation from other observations or models, and which are different from other studies? Also, what additional measurements would be helpful (or are planned) to further define the three-dimensional flow field as it relates to the OMZ?

Figures 10 and 11 have a lot of useful information, but can be difficult to interpret because of the noisiness of the velocity field and the Lagrangian nature of the measurements. I recommend adding one or two large, bold schematic arrows to indicate the main flow features that are discussed in the text (NECC, its recirculation north and south, Guinea Dome). You could also consider plotting the float trajectories in a separate panel since they can be difficult to see behind the ADCP vectors.

It's difficult to see the direction of the circulation in figure 2 because the arrow are so small. I recommend using larger arrowheads with fewer and larger arrows.

p. 2162, line 14: "During the preconditioning phase of an AMM..." Do you mean 'negative AMM'?

It's difficult to see the white 'x' in figure 1 and the black 'x' in figure 10. Maybe put circles around them to make them stand out more. Same for figure 11.

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