

Interactive comment on “A Study of the Variability of the Benguela Current” by Sudip Majumder and Claudia Schmid

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Given the excellent review of anonymous reviewer #1, I only have few points to add. While the authors seem to have derived an excellent data set of the horizontal velocity field in the upper 800 m of the water column (only in regions >1000 m deep!!!), the analysis of the transport variability has some loose ends that need to be addressed. The required revisions may be classified as "major".

Major points:

1) Which process creates significant negative (westward) transports of 7 ± 4 Sv across the B-D transect (perpendicular to the shelf break)? There are peaks exceeding 15 Sv in magnitude! Where does this water volume come from? Is this a downstream

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signature of the upwelling jet known as "Columbine Jet"? Interestingly, there seem to be instances of high correlation between the zonal transport perpendicular to the shelf break and that at 3W. Could some of these variations be caused by coastal wind variations (driving the upwelling jet)? In my view this is an important feature that needs to be studied and explained as part of this paper.

2) Total volume transport is only one limited aspect of scientific interest. Heat and freshwater transports and also nutrient fluxes are probably of similar or even higher significance. Changes in the baroclinic flow structure would be another point worth exploring. Have the authors considered to extend their analysis to those features? If not, I suggest the paper be renamed to "A Study of the Variability of Total Volume Transports of the Benguela Current." As it is, the current title may be misleading.

3) Given that the authors have developed a complete data set, I am confused as to why the authors used four different southern latitudes of 28, 30, 31 and 35. Why not only 28 and 31, or only 30 and 35? Why not a continuous section at 1 degree steps?

4) The authors' reference to "transport in the upper 800 m" can be misleading. The fact that the analysis excludes regions <1000 m in depth needs to be stated in the abstract and elsewhere.

Other points:

Page 9 => found that Benguela Current transport is larger than "that derived from the" Sverdrup balance (their Figure 2a,b). => Insert suggested phrase.

Sverdrup Gyre => Where does this terminology come from? Technically this term is incorrect because the Sverdrup balance only describes most but not all of the dynamics inherent with subtropical gyres. You wouldn't call them "Stommel Gyres" either, would you? One option is to rename this to "Sverdrup balance", but perhaps a better option would be to use "Ekman pumping" as a parameter in the analysis, which would avoid the unnecessary discussion about the validity of the Sverdrup balance in the region.

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