

## ***Interactive comment on “Eddy Surface properties and propagation at Southern Hemisphere western boundary current systems” by G. S. Pilo et al.***

**Anonymous Referee #2**

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This paper gives an overview of some eddy statistics in the 3 Southern Hemisphere western boundary current systems using Chelton's global eddy dataset. The authors make the case that the role played by eddies in these systems is dynamically important, and therefore that analysis of the statistics of these eddies can contribute to our understanding of the circulation.

In general I found the manuscript well-written (subject to a number of minor grammatical/spelling mistakes which I have tried to correct below) and the figures very well presented. However, I am concerned that the extent of the analysis is somewhat shallow. The authors need to do more to connect their understanding of eddy statistics with the dynamics of these regions. The best example of such a connection is Figure 6, which I found very illuminating. But I think the authors can do more. Details below.

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### **MAJOR COMMENTS**

1. As noted above, the analysis is somewhat superficial. The main indication of this superficiality is that, after reading the paper carefully, I can't identify any improvement in my understanding of eddy transport in these regions, which was promised in the abstract. In short, the paper does the statistical analysis without pushing the boundaries of scientific understanding. A few suggestions of how the authors might enhance this manuscript:

- Can these statistics be used to investigate the mean transport, or temporal variability, of Agulhas leakage or Tasman Leakage?
- Is there time-variability in eddy properties which may allow identification of forcing of the eddies, or the effect of eddies on local circulation features such as the Zapiola gyre?
- Are the temporal trends matching the southward progression of WBC systems?
- Relating properties to more easily attainable metrics, such as eddy kinetic energy.
- Investigating the extent to which they can use eddy decay rates to characterise barotropicity of eddies.

2. Eddy amplitude and rotation speed are highly correlated, as one might expect based on geostrophy alone. Are one of these redundant?

3. Much is made of the difference between cyclonic and anticyclonic eddies in the histograms, but it is not clear that these differences are statistically significant. A more in-depth analysis of whether these differences are important would be a useful addition.

### **MINOR TYPOS**

- Abstract, line 4: on -> in
- line 6: local -> the local

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- line 7: Main -> The main
- line 15: anticyclonics -> anticyclonic eddies
- p. 137, line 19 & 22: after -> using
- p. 138, line 1: persisting -> persistent
- line 2: unorganized -> disorganized
- p. 139, line 4: Heigh -> Height
- p. 140, several locations: particularity -> inaccuracy?
- p. 142, line 15-16: propagate -> propagating
- line 18-19: intraseazonal -> intraseasonal
- p. 146, line 16: isopicnals -> isopycnals
- line 18: especulate -> speculate
- p. 148, line 17: unanswered -> unanswered
- line 20: restrained -> constrained

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Interactive comment on Ocean Sci. Discuss., 12, 135, 2015.