

## ***Interactive comment on “Wind increase above warm Agulhas Current eddies” by M. Rouault et al.***

### **Anonymous Referee #1**

Received and published: 14 November 2014

This manuscript presents a systematic investigation of surface winds over eddies in the region of Agulhas current eddies. The effect of six different eddies on the wind field studied using satellite data: QuikScat winds, AMSR-E sea surface temperature and merged altimeter sea level anomalies. The interaction of sea surface temperature and currents with surface winds, and in particular satellite retrieved winds, is a complicated subject with many unknowns. The manuscript is well written and the analysis seems to be thorough.

General comments/questions:

QuikScat was overestimating the wind speed, compared to other measurements; scatterometer, altimeter and buoys (see e.g. <http://cersat.ifremer.fr/data/products/calval/quikscat/quikscat-winds/2013-01-18-15-21-15/2013-01-18-15-23-06>). In particular at high winds QuikScat showed a different behavior and thus the effect of wind

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increase over eddies may be overestimated as well, at least when winds are above 19m/s. Fore et al. (2014) IEEE TGRSS DOI:10.1109/TGRS.2012.2235843 have made a reprocessed QuikScat data set (available at [podaac.jpl.nasa.gov](http://podaac.jpl.nasa.gov)). Perhaps this is what you used? Please specify.

Page 2375 and 2376: Reasons for observing / not observing wind speed increase over eddies:

- 1) If incoming wind speed might be related with the wind speed increase, it would be really interesting to see if there is a difference in the wind speed histograms for the cases with wind speed increase contra those without.
- 2) Perhaps there are also differences related to the incoming air temperature. This is only indirectly discussed through the four wind direction sectors in connection with figure 5. Temperatures could be taken from an atmospheric reanalysis data set.
- 3) The presence of storms in the area is indicated as a possible reason for not seeing the wind speed increase in many of the cases (page 2375 bottom). Overall, it seems reasonable that the wind speed increase would require a certain stationarity of the environment in order to be observed. Would it be possible to calculate spatial variability, perhaps from an atmospheric reanalysis data set, to see if there is a relation with fronts or low pressure centers?

Specific comments:

Page 2370, l. 5: “from low to high wind speed” – please indicate a range in m/s.

Page 2371, l. 2: what is “Agulhas a ring” ?

Page 2372, l. 3: Please specify where the satellite data sets are downloaded from and when. Is it the reprocessed QuikScat data set? (see general comment above).

Page 2374, l. 23: remove “shows”

Page 2374, l. 26: I believe that 2007 should be 2003.

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Page 2376-2377: There is some discussion of filtered data in other studies, but the nature and purpose of this (lowpass?) filtering is not described.

Page 2381, l. 10: I don't see how it can be concluded that two moorings are needed. Please leave this out.

Page 2378, l. 1: Grodski is spelled Grodsky in the reference list.

Page 2379 , l. 10: a bracket is missing.

Figure 2-5: Please add units.

Figure 5: The numbers on the color bar are too small.

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Interactive comment on Ocean Sci. Discuss., 11, 2367, 2014.