

Answers to reviewer #1 (J. Cotton)

1. In the introduction it is probably worth mentioning that we also have ASCAT on Metop-B as well now.

Indeed, we agree. “The Advanced Scatterometer (ASCAT) is one of the instruments onboard the Metop-A satellite, which is a polar-orbiting meteorological satellite launched on 19 October 2006...” has been replaced by

“The Advanced Scatterometers (ASCAT) onboard the Metop satellite series are designed to determine the near-surface winds over the ocean. The first ASCAT onboard Metop-A satellite, the so-called ASCAT-A, was launched on 19 October 2006. The second onboard Metop-B satellite, i.e., ASCAT-B, was launched on 17 September 2012. The Ocean and Sea Ice Satellite Application Facility (OSI SAF) ASCAT-A derived wind products are operational since February 2007, whereas the OSI SAF ASCAT-B wind products are currently in development status. ASCAT operates ...”

2. The numbering of WVC is slightly confusing. For 12.5-km ASCAT I would normally expect the WVC to be numbered from 1-82, from left-outer swath to right-outer swath. In this paper the WVC are numbered from 1-41, from outer-swath to inner-swath, for both left and right swaths. This is fine but just needs to be made clearer in the text as at first glance figure 5 looks like data from just one swath. Probably also worth explicitly stating how many WVC there are.

Indeed, the WVC is numbered from 1-82 from left-outer swath to right-outer swath for 12.5-km ASCAT product. However, considering that WVCs in the left swath have the same observing geometry with those in the right swath, it makes more sense to integrate the results of both swaths with a single WVC number reference from 1-41 (from outer-swath to inner swath) for both swaths. This has been clarified in the introduction.

3. In Section 4, could do with a little more explanation about how the probability of occurrence is calculated as 0.3

The following text has been added: “Assuming that the wind direction uncertainty is characterized by a Gaussian distribution, the proportion of data (wind direction) values within 45 degrees is 99.73% (or 95.45%) provided that the 2D-VAR uncertainty is 15 degrees (or 22.5 degrees). In other words, the percentage of values beyond 45 degrees is 0.26% (or 4.55%)”.

4. In potential rain contamination cases where the chosen high-rank solutions are of poor quality, but in marginally better agreement than the first 2 solutions, then rejecting the high rank solutions will still be beneficial as it will allow VarQC to reject the entire report if it cannot resolve the remaining rank1 and rank2 solutions. However, I agree that ideally all solutions should be rejected by QC in such cases.

Good point. We have added the following sentence in Sect. 4: “This is an indication of potential rain-contaminated ASCAT winds. Such poor-quality cases should be quality-controlled, i.e., all solutions rejected rather than only the high-rank solutions. Although rejecting high-rank solutions may lead to MLE-based QC passed WVCs (MLE of first and second-rank solutions is usually low

for rejected high-rank cases), the latter can easily be filtered by the 2D-Var QC, which checks consistency between the ASCAT wind solutions and the 2D-Var analysed field.”

5. The plots in Figure 5 need to be larger and the lines are quite difficult to indentify on the left hand plot – suggest either group the WVCs as per the plot on the right or alter the line styles to something easier to differentiate. Also the y-axis title on the left hand plot should be wrt to ECMWF and not buoys.

Done. Color plots are now used to differentiate the line styles.

6. Need to be careful with how the “sets” of winds are referred to in Section 3 on page C3759 Interactive Discussion Discussion Paper 8847. For example, the phrase “the wind retrievals with high-rank solutions rejected” is slightly ambiguous. Standalone, it could be taken to mean the set of wind retrievals remaining, after excluding the rejected high-rank solutions. Or as intended, it could refer to those winds with high-rank solutions, that have had those high-rank solutions rejected. Perhaps “the retrievals with rejected high-rank solutions” is a bit clearer?

Indeed, “the retrievals with rejected high-rank solutions” seems more appropriate and as such adopted throughout the text. So:

7. It’s worth thinking (not neccessarily in this paper) about how such a QC method might be implemented in practice in the L2b BURF product. The WVC quality control flags are usually used to reject/flag an entire report, rather than individual aliases. I therefore assume that the spurious high-rank solutions would be excluded (pre-filtered) from the BUFR product all together? The other option would be to flag the affected WVCs so that users could implement their own check to remove the artificial high-rank aliases should they wish to do so (requires effort on users’ part).

The implementation of such a QC method is still under discussion. We prefer to reject the individual aliases after the point-wise wind retrieval but before the 2D-VAR ambiguity removal. Additional flags could be used to identify the affected WVCs, as well as the selected wind solution after implementing such a QC method.

8. Technical corrections

All suggestions have been adopted.

We greatly appreciate the reviewer’s efforts to improve the paper.