Review of the manuscript "Support vector machine tropical wind speed retrieval in the presence of rain for Ku-band wind scatterometry" by Xu and Stoffelen

This paper uses the support vector machine (SVM) method to correct the Ku-band scatterometer wind speed under rainy conditions. To achieve promising results, the authors first employ the newly developed quality indicator, namely Joss, to filter the false alarmed winds (i.e., rain-free winds rejected the nominal quality control procedure) in the rejected data set, and then apply the SVM method to map several input vectors (2DVAR wind speed, OSCAT retrieved wind speed, normalized Joss, and MLE) to the 'true' wind speed (using the ASCAT winds as reference). The simultaneous wind and rain estimation using SVM is also presented, which results are promising and may be beneficial to a variety of applications.

The contents of this paper are clear, and the steps of the methodologies are well described. In my opinion, the manuscript presents a notable improvement in the estimation of scatterometer wind speed under rainy conditions. My comments are listed as follows:

1. The observed radar cross sections may still contain useful wind direction information under light rain conditions. Why the wind direction is not considered in the SVM model?

2. The authors mostly present the results of rain-contaminated OSCAT winds. To better understand the advantages of the proposed method, I'd suggest including the statistical scores of QC-accepted data (for reference) in the beginning of the results section.

3. Though the statistical scores of the corrected OSCAT wind speed are better than those of nominal wind inversion (at rainy area). Fig. 3(a) and (b) clearly show that there is a scaling issue with the corrected wind speed versus ASCAT wind speed. If this cannot be eliminated, the corrected wind speed may be useless. More discussions on this aspect would motivate the users to use the corrected winds in their applications.

4. Similar to 3, Fig.8 does not show remarkable impact of the SVM method on the wind correction. It looks to me the nominal wind inversion already does a very good job in retrieving winds for this particular case.

5. The figures presented in the manuscript are quite obscure, such as Fig. 6. The authors are encouraged to improve the quality of those figures.

6. Line 15, replace 'eliminating' by 'mitigating';
7. Line 34, remove 'sized square';
8. Line 42, remove 'described above' to keep the manuscript be concise

9. Line 43, ‘Combined retrievals ….(Li et al., 2014)’. This sentence is a bit obscure, please rephrase.
10. Line 84, ‘it is indicated’ rephrased as ‘it indicates’
11. Line 98, ‘… supports NWP before obtaining monitoring … models.’ The second half of this sentence is obscure, please rephrase.
12. Line 115, I believe in PenWP the measured NRCS rather than the simulated ones are used in the denominator of this equation.
13. Line 116, the whole denominator (not Kp) represents the NRCS variance.
14. Line 144, do you think the threshold can be applied to other scatterometers, such HY-2 satellite scatterometers?
15. Line 151, ‘Enhance wind variability …’ rephrased as ‘Increased wind variability …’
16. Lines 161-163, ‘In the established model, …, by rain’. Conclusive sentence should appear in the section of results or discussions.
17. Lines 166-167, what do you mean by ‘non-linear features are linearized’?
18. Line 182, the symbol at the left side of Eq. (5) is inconsistent with Eq. (4).
19. Line 184, the expression (6) is quite informal.
20. Line 196, ‘more optimal NRCS’ rephrased as ‘better’
21. Line 198, remove ‘And’
22. Line 223, what does ‘latter distribution’ mean?
23. Line 226, what do you mean “By design,” ?
24. Above line 259, it seems the captions in the second columns of (c) and (d) are reversed.
25. Line 305, ‘colour dimension’ rephrased as ‘colorbar’
26. Line 310, ‘more simple’ with respect to what?
27. Line 333, ‘In Figure 6, … both are in degree.’ This sentence is unnecessary.
28. Line 340, ‘GMP’ rephrased as ‘GPM’
29. Line 350, Fig. 7(d), why don’t you show the same region as Figs. 7(a)-(c)?
30. Line 358-395, ‘This further confirms … in case of rain’. Indeed, the authors didn’t test other input vectors for the SVM method, right? How do you get such conclusion?
31. Line 408, could you explain what is the ‘non-convex feature’?