

## Author Replies to Reviewer #1 Comments

Manuscript Title: Clutter Mitigation, Multiple Peaks, and High-Order Spectral Moments in 35-GHz Vertically Pointing Radar Velocity Spectra

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We thank both reviewers for taking the time from their busy schedules to read and provide valuable feedback to our manuscript. All comments were thoughtful and lead to changes to the manuscript. Thank you.

Please find below specific replies to reviewer #1 comments. The packet of documents uploaded to AMT includes this document as well as the revised manuscript with and without Track Changes.

{*Reviewer comments are italic.* Author comments are indented and in regular font and.}

### Reviewer #1.

Thank you for your helpful and insightful comments.

#### **General Comments**

*Page 3 paragraph 2 – this paragraph discusses potential clutter sources for wind profilers which are not an issue at Ka band. It should be noted here that wind profilers operate at a range of frequencies, and thus at a range of sensitivities to clutter. Birds and bats are not a problem at lower VHF frequencies for example.*

This is a good point to highlight to the reader. A couple sentences were added to this paragraph. (See page 3, line 3 in the Track Change version.)

*Page 3 line 15 – insects are mentioned here as presenting with narrow spectral peaks, but not mentioned again in the paper. Can the techniques described be applied to insect interference?*

Yes, the techniques can be applied to identify and remove insect scattering. The text in the first paragraph of the Conclusion was modified to mention that insects can be removed using these techniques. (See page 12, lines 3 to 14 in the Track Change version.)

*Page 6 paragraph 4 (near line 20) – how did you decide only 3 points should be interpolated across? Is this a function of the number of spectral points?*

Good point. Text was added to clarify that the 3-pt interpolation is based on the characteristics of this dataset and the reader should adapt this value to their dataset. (See page 6, line 36 in the Track Change version.)

*Page 8 line 20 – I think it should read power drops LESS than 3 dBm for clutter-free spectra. I am also curious as to why you discuss 3 dBm as the demarcation, and then choose 2 dBm for the threshold? The discussion indicates this it to be conservative, but perhaps this point could be made more clearly?*

*In general, the use of thresholds should be justified.*

Yes, the logic should be 'less' and not 'greater'. Text has been corrected. Also, the threshold was changed to 3 dBm to match the text and should be adjusted to match different radar datasets. Regarding thresholds in general, text has been added to mention that thresholds are dependent on the radar dataset, and that the code used in this study is available for download as supplemental material. Figure 11 was re-generated after using a threshold 3 dBm. (See page 7, line 26 and Fig. 11 in the Track Change version.)

### **Technical Corrections**

*Page 3 line 3 – “vertically point” should read “pointing”.*

Corrected.

*Page 3 line 14 – first reference to KAZR, and thus should be defined as it is on page 4 lines 9 & 10*

Corrected.

*Page 4 line 13 – sentence does not make sense, perhaps remove “the clutter from the stationary ground clutter targets”*

Sentence modified. (See page 4, line 4 in the Track Change version.)

*Page 4 line 23 – remove “from nearby structures”*

Text removed.

*Page 6 lines 13 & 25 – “abscissas” should be abscissa*

Corrected (See page 6, line 2 in the Track Change version.)

*Page 6 line 19 – remove either “in linear units” or “linear interpolation”*

Corrected (See page 5, line 35 in the Track Change version.)

*Page 6 line 24 – should read “illustrate the relatively”*

Corrected (See page 6, line 1 in the Track Change version.)

*Page 8 line 5 – “away from either 3-point interpolation” should read “away from THE 3-point interpolation”*

Corrected (See page 7, line 12 in the Track Change version.)

*Page 13 line 14 – “calculated high-order moments” should be calculates*

Corrected (See page 12, line 18 in the Track Change version.)