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Comment

## ***Interactive comment on “Using particle filter to track horizontal variations of atmospheric duct structure from radar sea clutter” by X. F. Zhao and S. X. Huang***

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Comments of Referee #1

General comments:

Making use of the inherent Markovian structure of the split-step Fourier PE solution, the authors adopt particle filter to track horizontal variations of refractivity profile from radar sea clutter. Overall the techniques presented are of interest and should be considered as publication-worthy.

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Response: Thanks for your positive comments of our work.

Specific comments:

1. The introduction is well written. However, add following references to make it more complete.(Weckwerth et al., 2005, J. Appl. Meteorol.; Park and Fabry, 2011, J. Atmos. Oceanic Technol.).

Response: Thank you for your recommendation of these two references. We have read these papers carefully and learned a lot. It is helpful for us to complete this paper and is a good guidance for our future work. In our revised manuscript, these references are added in appropriate places.

2. This article focuses on how to solve RFC problem. Particle filter is just a solver tool. I suggest the authors reduced the length of PF and just kept main implementation steps.

Response: Your suggestions may be reasonable. However, from the journal's name, 'Atmospheric Measurement Techniques', technical presentations might be considered as important. If readers are familiar with PF technique, this section may seems superfluous. However, for readers not familiar with PF, detailed presentation will be helpful.

3. Figure 2 shows the differences of two similar surface-based ducts. What about smaller/larger ducts?

Response: We have added the propagation loss versus range for a smaller surface-based duct in Figure 2, as well as some illuminations.

Minor Corrections:

1. Page 1, line 26: 'estimates' should be replaced by 'estimations'.

2. Page 2, line 5: 'has been' should be replaced by 'have been'.

3. Page 2, line 7: 'The advantage of RFC is that' should be replaced by 'The advan-

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tages of RFC are that’.

4. Page 3, line2: ‘Their drawback is that they require’ should be replaced by ‘The drawback of MCMC is that it requires . . . and becomes’.

5. Page 3, line 5: ‘show’ should be replaced by ‘showed’.

6. add a reference for eq. (5).

7. Page 9, line 25: ‘using the corresponding synthetic propagation losses at sea level to quantify’ should be replaced by ‘the corresponding synthetic propagation losses at sea level are used to quantify’.

8. Page 10, line 12: ‘structure’ should be replaced by ‘structures’.

9. Page 11, line 13: ‘it required much larger computation’ should be replaced by ‘it requires much more computation time’.

10. Page 12, ‘are also show’ should be replaced by ‘are also shown’. Maybe I have missed some editorial mistakes, please check your paper carefully again.

Response: Thank you for your careful modifications. We have modified the above editorial errors in our revised manuscript according to your suggestions. Besides, we have invited Professor Jie Xiang to check for the spelling and grammatical errors. Professor Xiang was a visiting scholar in NCAR (National Center for Atmospheric Research).

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 6059, 2012.

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