Atmospheric
Measurement
Techniques
Discussions

Interactive comment on "Joint retrieval of aerosol and water-leaving radiance from multi-spectral, multi-angular and polarimetric measurements over ocean" *by* F. Xu et al.

F. Xu et al.

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We thank the reviewers for their professional comments and suggestions. Detailed responses to Anonymous Referee #1 are provided below:

1. In conclusion, this work is worth for publication in AMT.

Reply: Thank you.

2. But I strongly recommend that you resubmit a revised version, because the present form of your manuscript looks like a short dissertation. The manuscript should be recompiled by focusing upon what are new and different against the previous studies.

Reply: The length of the paper arises from the introduction of three new concepts as summarized by Reviewer 2: (i) An efficient RT model which couples Markov chain and doubling methods; (ii) A retrieval algorithm which obtains water-leaving radiance and aerosol simultaneously by using an empirically adjusted bio-optical model; (iii) Validation of the retrieval algorithm by truth-in-truth-out tests; (iv) Application of the retrieval to analyze real instrument measurements. All these developments are new and differentiate our work from previous studies. However, revision has been made to make the main body better organized (cf. replies below).

3. For an example, you can simplify the section 2. It seems to be just description of RT model, and then the manuscript becomes to be redundancy.

Reply: Section 2 was simplified in the revised paper. Please refer to our reply to the 3rd Comment of Reviewer 2.

4. You miss the solid curve (extended adding-doubling) in Fig.2.

Reply: The solid curve for extended adding-doubling computation in the left two panels of Fig. 2 are present, and they have very good agreement with SOS computations, which are shown as dots. To avoid confusion, we now use different plot style in the right two panels (which show the difference).

5. Other figures also should be more effectively treated. Figs.4, 5, 6, 7, 8 and 11 seems to be bored at least for me. I hope you come up with various ideas to make your figures.

Reply: We believe these are valuable contributions to the ocean color remote sensing community who is interested in knowing whether multi-angular, multi-spectral, and polarized measurements can meet the PACE requirements, and to those aerosol scientists who hope to see the whether the aerosol retrieval accuracy from the proposed algorithm meets the climate requirements. Our view is that the figures are informative as presented.

6. Comparison with GRASP is introduced in Abstract a <but I found it just in Fig. 12.> And even in this figure, the results with GRASP seem to be not so necessary because AERONET data are available there. If you have some more results compared with GRASP, please let me know them.

Reply: The comparison to GRASP retrieval adds value to our paper by helping us get a sense about how much difference can be caused by two different algorithms as well as whether the difference to AERONET is also seen from other retrieval code. To avoid misleading, however, in the revised abstract we don't give equal weights to AERONET and GRASP as validation, namely we mention in a separate way that the comparison to GRASP is only for the AERONET USC_SeaPRISM case.

7. Anyway I am very interested in this work. I wish the manuscript should be carefully revised based on the scientific concept.

Reply: Thank you for your comments, which have definitely improved the quality of our paper. The revised paper was in the supplement file.

Please also note the supplement to this comment:
http://www.atmos-meas-tech-discuss.net/amt-2015-394/amt-2015-394-AC1-supplement.pdf
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