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Comment

## ***Interactive comment on “Accuracy assessment of Aqua-MODIS aerosol optical depth over coastal regions: importance of quality flag and sea surface wind speed” by J. C. Anderson et al.***

**J. Wang**

jwang7@unl.edu

Received and published: 13 September 2012

As the corresponding author of this manuscript, I like to make a few remarks while we are preparing to address all the comments raised in the three reviews we received so far.

I like to thank reviewers for their comments, and especially the first reviewer for the constructive suggestions. One of the concerns in the reviews is that this paper lacks groundbreaking science and what are studied and found in this paper appears similar to some previous work that were cited in this paper. In addition, the wind speed effect

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on MODIS AOD retrieval along the coast, as studied here, may not be case in MODIS collection 6.

I agree that our interpretation of MODIS AOD uncertainties along the coast re-confirms the finding in the previous work that was pretty much done by the same group in the context of data assimilation of AOD over the global oceans. But, interpretation of MODIS AOD uncertainties is only part, but not the primary motivation of this paper. Our motivation here is to study if the MODIS AOD retrieved over the coast can represent the statistics of counterparts from AERONET. Past analysis have focused on the bias, absolute error, correlation, etc. While these type of analysis are important, they can not fully tell how good is the fit between MODIS AOD and AERONET AOD because data spread and data histogram can not be described by mean or correlation alone. The extreme AOD events, while low in probability, are important for understanding how aerosol climatology is changing. By conducting analysis of histogram comparison for 9yr+ of Aqua data, this paper offers some insights on how well MODIS AOD can represent the aerosol climatology (beyond the mean or median), which is interesting and important, as commended by the first reviewer.

Furthermore, past studies have focused MODIS AOD uncertainty analysis either over land or over ocean. This paper shows that the retrievals over the coastal regions from either land or ocean algorithm have larger uncertainty than their respective non-coastal counterparts. While this finding is somewhat not surprising, it is among the first to quantitatively shown with analysis of 9+ yrs of Aqua data.

I have been looking forward to using MODIS collection 6 data since 2010 when I first heard of it. While I cannot wait for it, it is not released yet. I will be happy to see if wind speed effect is completely disappeared in collection 6. However, I also think that the collection 6 won't be perfect. The larger uncertainties may still exist along the coastal region, and the evaluation of AODs retrievals in collection 6 also requires the analysis of histogram comparison. The results in this manuscript thereby can be considered as the last (if not first) quantitative benchmark of these issues before collection 6 is

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officially released. I foresee if we have such benchmarks for every collections (and plot all them in the Taylor diagram), we will have a traceable record on how MODIS AOD retrievals are improving over the past 10 years and in future collections, especially in terms of their reduction of uncertainties in the representation of aerosol climatology.

Many thanks again to all reviewers. We are now revising the manuscripts to address every point raised in the reviews, and point-by-point replies will be followed.

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Interactive comment on *Atmos. Meas. Tech. Discuss.*, 5, 5205, 2012.

AMTD

5, C2160–C2162, 2012

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