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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Variations in optical properties of aerosols on monsoon seasonal change and estimation of aerosol optical depth using ground-based meteorological and air quality data" *by* F. Tan et al.

F. Tan et al.

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This paper describes development of a model for predicting AOD at an island site in the Southeast Asian Maritime Continent, using regression techniques trained on surface Meteorological parameters. The model is evaluated relative to sun photometer measurements. There are binding studies referenced for developing an improved model (Tan et al., 2014; cited multiple times), though this appears to be gray literature. The topic is of importance regionally, as urban air quality is a significant day

to day factor in Southeast Asia. Development of these sorts of models is becoming fairly common place, as regional scientists attempt to characterize aerosol physics and transport mechanisms. The topic is, therefore, suitable for consideration by ACPD. The manuscript is complete, though there are issues with its construction. Tables and figures are clear and legible.

RESPONSE: First of all, I appreciate very much for your positive comments.

I initiate this review with the benefit of having seen Reviewer #1's comments. I will echo many of that person's commentary, though my summary recommendation to the Editor is that this paper be returned simply for Major Revision. Whereas many papers suffer from credibility, clarity and myriad other potential issues, I do not believe that this paper merits an outright rejection on any of those standards. The manuscript is simply over-written. The author appears to be a young scientist (multiple references to self, though limited to what appears conference abstracts). The paper very much reads like that of a young scientist looking to impress. There's nothing wrong with that. The paper simply needs a thorough edit to focus and refine content. There are senior scientists on the author list. Oversight is necessary here. I'm attaching a full technical edit to help the process. However, someone needs to step in and provide some guidance. It wouldn't take but an afternoon's work, and this paper would be more than acceptable for ACP.

RESPONSE: We have refined the content according to your suggestions.

We have modified the description of the procedures in the methodology section so that the article now looks more understandable.

You may found the new version in the attachment.

For the sake of your convenience, we highlighted the related sections in different colors: Yellow → grammatically related problems / rearrangement of sentences. Grey → citations are rearranged according to chronological and alphabetical order. Green →

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new addition information.

The science narrative needs to be simplified. As Rev#1 says, there is no real reason for the discussion of typing. There are other papers (see Omar et al., 2005) that use AERONET data for typing aerosols, and they use far more information than is accomplished here, with just AOD and AE. In fact, starting with the highly confusing title through the introduction, a proper motivation for this study is mostly lacking. Its not enough to just say that 'other people have done this'. Why are you interested in developing such a model? Why is this unique to Penang and Malaysia? Who will use it? Why will it make a difference? Why should the community recognize this unique application? Such discussion should then lead to a proper hypothesis about the merit of model development, and then a description of the methods and experimental design necessary to reach a conclusion.

RESPONSE: We agree that the science narrative needs to be simplified. We feel that it is important to effectively identify the source of aerosol and dominant type of aerosol in our study site as there is no such in-depth study done on Penang site. Meanwhile, we agree that Omar et al., 2005 has been very informative on aerosol classification issues. However, in our study we intent to compare different criteria suggested by various researchers for aerosol classification. The results show that the aerosol classification method by using AOD and AE are still useful in our study area. Subsequently, the best criteria (after the comparison) is adopted to correlate with other related issues such as the seasonal wind flow pattern. These information are helpful for understanding the aerosols variation in Penang.

We have revised the introduction and added new information to state more clearly (1) our motivation, (2) interest, (3) why is this unique to Penang and Malaysia in the revised version (see the attachment). To address the issue of "who will use it, why will it make a difference, why should the community recognize this unique application", please refer to the last paragraph in Section 4 (Conclusion) in the revised version.

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The development and evaluation of the model is the core of the paper. The work here is of merit, and is worthy of publication. Recast the discussion to focus on and highlight these strengths. Trim unnecessary context. Less is more. Of note, however, please consider Toth et al. (2014 – ACP), as there is a discussion there of the impact of the vertical distribution of aerosol, as profiled from lidar, on interpretation of passive remote sensing measurements.

RESPONSE: We have recast our discussion and highlighted the strengths of the proposed AOD prediction model. We have trimmed unnecessary context as well. In addition, the reference of Toth et al. (2014) has also been included into our discussion.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/14/C7379/2014/acpd-14-C7379-2014-supplement.pdf

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Interactive comment on Atmos. Chem. Phys. Discuss., 14, 19747, 2014.