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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A robust calibration approach for PM_{10} prediction from MODIS aerosol optical depth" *by* X. Q. Yap and M. Hashim

X. Q. Yap and M. Hashim

mazlanhashim@utm.my

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Thanks for the comment given. For the 1st and 2nd remarks The equation presented in the discussion paper is: ãĂŰE(Y)ãĂŮ_mn=α_fix+β_fix (ãĂŰAODãĂŮ_mn-[ε_mn+ε_fix]) (eq. 1) Where, ãĂŰE(Y)ãĂŮ_mn is the estimated PM10 concentration on month m, at site n; ε_mn random error for month m, and site n; ãĂŰAODãĂŮ_mn is MODIS AOD value in the grid cell corresponding to month m, at site n; α_fix and β_fix fix is the intercept, and slope; ε_fix fix error or adjustment derived from longterm observations of MODIS AOD which is correspondent to the 2nd remarks ε_fix= α - βãĂŰ(AODãĂŮ_mn). There is a typesetting error in the paper. Thanks for pointing

it out and hope it clarify some of the misunderstanding here.

Furthermore, the AOD fix effect represents the average effect of AOD on PM10 concentrations and AOD random effects, ε_mn represents the monthly variability in the PM10-AOD relationship. If the equation were to be rewritten as you suggested (eq. 2), and further simplify to (eq. 3) it would have complicate the presentation of the equation. ãĂŰE(Y)ãĂŮ_mn=α_fix+β_fix ãĂŰAODãĂŮ_mn-β_fix ε_mn-ãĂŰβ_fix εãĂŮ_fix (eq. 2) ãĂŰE(Y)ãĂŮ_mn=α_fix+β_fix ãĂŰAODãĂŮ_mn-ε_mn (eq. 3) For example, α_fix and β_fix would model the large-scale and season-independent additive and multiplicative bias, and ε_mn would be the season-site-sensor dependent bias. This way is rather confusing and, besides, the assumption is not a seasonal but monthly coefficient. The tropical climate of Malaysia is slightly different from that of Mediterranean climate. In Malaysia we do have monsoon rain but it scattered unevenly across the peninsular due to the topography and, this is the reasons why we uses a random error approach in this robust calibration. If seasonal approach was adopted, this will further generalize the assumption and introduce more error in the output. I hope this will clarify the issue you commented in the 1st and 2nd remarks.

In this paper, we uses statistical method to robustly calibrate the AOD retrieved from satellite to predict PM10 concentration. The method itself works as shown in this paper given that the AOD dataset must be available for that particular locations. While epidemiological studies is important at daily temporal resolutions, this paper focuses on monthly average with an aim to improve the current use of satellite derived air pollution indicators in Environment Performance Index (EPI) reporting. Therefore, the applicability of this approach for a different time window is not an issue.

for the original fle of reply pls see attached file

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/12/C10943/2012/acpd-12-C10943-2012-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 31483, 2012.