Atmos. Chem. Phys. Discuss., 13, C9031–C9033, 2013
www.atmos-chem-phys-discuss.net/13/C9031/2013/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Factors that influence surface $PM_{2.5}$ values inferred from satellite observations: perspective gained for the Baltimore-Washington Area during DISCOVER-AQ" *by* S. Crumeyrolle et al.

Anonymous Referee #2

Received and published: 12 November 2013

The study utilized surface/aircraft and satellite data collected during DISCOVER-AQ field campaign to address the issues involved in relationship between surface PM2.5 and column aerosol optical depth over Washington-DC-Baltimore Area. Followings are my comments:

1. Be consistent while using PM2.5 without sub-script or with subscript. I see problem through out the paper.

2. Abstract needs to more informative or complete. For example Page 1, Line 26-27,

'The results indicate . . ...assumed to be negligible.' Predicted using what? Or how? Be more specific here. Also, include major findings of the study in the abstract.

3. Page 2, Line 7 – 'total mass concentration 'NEAR SURFACE' of the particle. . .'

4. Page 2, Line 8-10, Be specific, which part of the world you are talking about? Also, need a reference here. Even in US there are many rural PM monitoring stations exists.

5. Page 2, Line 25-29, these four points are not always true for eastern US. You must provide reference for each of those points. For example 3) uniform topography – what about Appalachian? 2) Uniform vertical distribution of aerosols? how do we know?

6. Page 2, Line 31 – both temporal and spatial scales/matching is important for AOD-PM relationships.

7. Page 3, Line 3 – AOD retrieval not measurement. Satellite does not make direct measurements of AODs.

8. Page 3, Line 5, Satellite does not retrieve AODs over Snow covered regions.

9. Page 3, Line 13-16, not sure if extinction are decoupled, may be mass measurements are decoupled?

10. Page 3, Line 16-17, 'He et al., . . .' vague sentence ,not clear, does not fit there.

11. Page 11, Line 29 – Typo? Is it 51 or 5.1?

12. Page 12, Line 18-19, How do you get that threshold value of angstrom coefficient? Provide more information and reference it.

13. Page 24, Table 1 – I don't see Figure 3 a, b, c – Are your referring to Figure 4?

14. Page 27, Figure 3, Must provide statistics for this comparison. Also, if there is any averaging performed over AERONET data, then it should be mentioned here. Also, the standard deviations should be plotted as vertical bar instead of fix value of 0.02.

15. In all the figures, you reported R or Rˆ2 value? Please check it again. It looks like

R value whereas you have written it as R^2 value?

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 23421, 2013.