

Interactive comment on “Characterization of coarse particulate matter in the western United States: a comparison between observation and modeling” by R. Li et al.

Anonymous Referee #1

Received and published: 13 June 2012

This manuscript presents the first comparison of PM_{10-2.5} between observation and CMAQ model simulation. Previous CMAQ studies focused primarily on PM_{2.5} or PM₁₀. This study however provides a very interesting result regarding the performance of CMAQ on the PM_{10-2.5}: the CMAQ underestimated the measurements systematically. The paper provides intriguing information for the model community and for the policy maker to rethink the uncertainty on air quality modeling. Several issues need to be resolved before it can be accepted for publication in ACP:

1. The major issue is what are the uncertainties associated with this indirect measurement method since those PM_{10-2.5} are taken to be the difference between PM₁₀ and

C3551

PM_{2.5}? Are those PM_{10&2.5} measured with the same instrument or different instruments? The uncertainties might be quite large if they are obtained from two different instruments.

2. What are the major sources for the PM_{10-2.5}? In the abstract, it seems they are more related with natural than human activities. In the text (3.3 weekly patterns), in some cases, they are more associated with human activities.

3. When addressing the causes of the model underestimation compared to observations, several speculations are given including the underestimation of emission inventory, incomplete sources and the limited point measurements vs a large domain etc. Is there any sensitivity study for the above factors or is it too difficult to do the sensitivity tests?

4. Some minor comments: Abstract: p11466, L4, “reporting” should be “reported”; L12-13, delete “To obtain insights for regional PM_{10-2.5} modeling”; “also” should be deleted; L24, “of the analysis” should be deleted.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 11445, 2012.

C3552