

***Interactive comment on “A three-dimensional
variational data assimilation system for multiple
aerosol species with WRF/Chem and an
application to PM_{2.5} prediction” by Z. Liet al.***

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Received and published: 5 June 2012

**Assuming that errors are uncorrelated within
several bins of a single species is also
controversial. Since aerosol species from different
bins are likely to come from the same emission
sources their errors will be correlated. Also,**

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correlation scales for a single species from different bins will be different. As an illustration consider PM1.0 and PM2.5. These two "bins" have different paths to formation which affects scales. Also, because of different physical properties these two "bins" e.g. have different deposition rates which will affect both vertical and horizontal scales.

I believe these issues should be discussed in the manuscript.

On p. 13538 I. 8 authors claim that 3D-VAR using total PM2.5 as a state variable degraded the results. If the experiment showed that it is so it would be worthwhile to document how much benefit is achieved using the assimilation method with aerosol species as state variables in 3D-VAR.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 13515, 2012.

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