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Interactive comment on "The impact of aerosol optical depth assimilation on aerosol forecasts and radiative effects during a wild fire event over the United States" *by* D. Chen et al.

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Thank you for the positive comments.

Our AOD data assimilation method was detailed in Liu et al. (2011), which is a 3DVAR approach and allows independent correction of individual aerosol species. We will add a brief description and suggested references on the method in the revised manuscript to highlight this.

We agree that AOD at a single wavelength has no sufficient information on the aerosol composition. The background error covariances, which are event and period specific statistics from the NMC method, played important role for mapping observed optical

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information into aerosol mass concentration space. While this does not always work very well, but it was indeed able to produce some good results with event-specific background error statistics such as for this case and others (e.g., dust dominated event).

Interactive comment on Geosci. Model Dev. Discuss., 7, 3851, 2014.