

Interactive comment on “Assessment of the effect of air pollution controls on trends in shortwave radiation over the United States from 1995 through 2010 from multiple observation networks” by C.-M. Gan et al.

C.-M. Gan et al.

chuenmeei@gmail.com

Received and published: 9 December 2013

p 23721, line 1-3 No brightening in the western US is contrary to Augustine and Dutton 2013

We miswrote the sentence. Table 2 shows brightening in both regions (east and west) in all-sky and clear-sky total and diffuse downwelling SW, all with greater than 95% confidence level. For the east and west also the all-sky direct is increasing, correlated with decreasing all-sky cloud amounts, but the clear-sky direct SW shows no significant

C8391

trend. The all-sky total SW result aligns with that of Augustine and Dutton 2013, and all the all-sky and clear-sky total, diffuse, and direct SW results align with those of Long et al 2009 (i.e. brightening total and diffuse SW in US). However due to the limited available measurements, it's difficult to conclude what is causing the significant brightening especially in the western US.

modification p23721, line 1-6 “The clear-sky radiation observation in the western US also show indication of “brightening” even though the AOD, PM2.5 and surface concentration do not vary drastically. This aerosol outcome is not unexpected because the CAA controls were mainly aimed at reducing air pollutants emission in the eastern US and air pollutant level in the western US are much lower since the beginning. This suggests other factors affect the “brightening” especially in the western US.”

p 23721, line 25 I would change 'likely' to 'possible'.

Agreed.

Some of the sites of CASTNET and IMPROVE are not very close to radiation sites and may not be appropriate for comparison; it would be useful to include distances of these stations from radiation sites so that we can tell which ones should compare well and which ones may compare less well because of the distance between the measurements. It should be emphasized that this monitoring only samples surface pollutants, nothing aloft.

Agreed. Information added into Table 1. These sites are selected based on the closest distance (compared to SURFRAD and ARM sites) and the longest available data (from 1995 to 2010). See supplement page 1

p 23730, lines 14+ How about scatter plots to demonstrate how well correlated PM2.5 and AOD are? Or are the sites too far apart?

In general, they matched moderate well ($R_{\text{east}} = 0.71$ and $R_{\text{west}} = 0.50$) (daily averaged and cloud screened). As you mentioned before, if the sites are closed, they

C8392

have higher correlation. See supplement page 2-3. The scatter plots of both regions (east and west) will be added into manuscript (p23730).

Please also note the supplement to this comment:
<http://www.atmos-chem-phys-discuss.net/13/C8391/2013/acpd-13-C8391-2013-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 23719, 2013.

C8393