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Atmospheric Chemistry and Physics Discussions

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.

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This paper seems determined to link the solar brightening over the US with aerosols. Augustine and Dutton (JGR,2013) made the point that the direct effect of aerosol optical depth (AOD) explains less than 10% of the brightening.

I think this paper should emphasize that pollution as measured by CASTNET and IMPROVE has decreased resulting in some decrease in AOD, but not in proportion to the decrease in pollutants. The other good point about the paper is that clear sky brighten-

ing has occurred and is maybe (likely) due to increased cirrus associated with air traffic increases.

Although the point was made by Augustine and Dutton, it is okay to emphasize that decreasing clouds or cloud optical depths are the most likely explanation of the brightening. Decreasing aerosols could possibly be linked to the cloud optical depth decrease through the indirect effect, but this is going to be difficult to prove.

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

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

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.

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?

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