

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.

Anonymous Referee #2

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The authors have combined a wealth of relevant data to assess the effect of air pollution controls on trends in short wave irradiance measured at seven BSRN sites in the USA between 1995 and 2010. Their results are interesting and innovative with somewhat speculative explanations suggested. Hopefully the following comments will help clarify and enhance this study. 23720 lines 21-22 repeat lines 17-18 23723 lines 23-28 A brief explanation of the methods used to estimate daytime cloudiness is required. In view of its importance citing references is not sufficient. 23724 lines 11-14 How many years data was removed? 2.5 Trend estimation Measured data should be presented in

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addition to the anomalies which are examined. This would allow the reader to obtain a clearer picture of the magnitude and significance of the trends examined. 23728 Unclear why the usually recommended non-parametric statistical test (i.e. Mann-Kendall) was not used to establish the significance of the trends after pre-whitening the data to remove the effect of auto-correlation commonly found in climate data sets. This avoids the assumptions adopted. 3. Results and discussion. Rather long, repetitive and diffuse. Shortening and clarifying perhaps by separating into two sections. The results presented in Figs. 2-8 should be replaced or supplemented by double mass plotting of the relationships between SO₂, SO₄, NO_x, NO₂, PM_{2.5} AOD and the fluxes of short-wave radiation. This would provide a direct and quantitative examination of the relationships at present discussed in a rather diffuse and general fashion. 23732 line 10 the units of cloud cover (1yr⁻¹) undefined and unclear. 23733 lines 15-16 'biasing the AOD retrievals low' unclear. line 18 What does 'the' aerosol mean? 23736 line 19 unclear, word/s missing after/before clear sky. Table 1 The co-ordinates and elevation of the sites needed. Fig 1 It would be useful to add contours to this figure showing fossil fuel combustion in the USA over the 1995-2005 period under study.

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