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Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "Solar radiation trend across China in recent decades: a revisit with quality-controlled data" *by* W.-J. Tang et al.

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Thank you for the helpful discussion!

(4) We thank you for your accepting the model uncertainty. Still we would like to give a little more explanation on how to get the parameter bounds. The hybrid model is converted from a radiative transfer model for clear skies and its major uncertainty lies in the parameters that are tuned when introducing sunshine data. The parameterization of the model is fully presented in the manuscript and relevant reference. To specify the uncertainty of the parameters, we selected seven SURFRAD stations, which have high-quality radiation data collected in USA for the period of 1997 $\sim$ 2008 (downloaded from http://www.srrb.noaa.gov/surfrad/index.html). Then, the Matlab software was utilized to analyze the uncertainty bounds of the parameters.



Regarding the Monte Carlo test, the programming is, of course, very easy. What we mentioned in last response is that a long time will be taken to get such a data set as each repeat of the calculation needs nearly one hour (considering we have 716 stations and many of them have data records > 40 years). That is why we tested the four extreme cases to see whether we need such a time-consuming job. The estimated trend of the solar radiation is not sensitive to the four cases, and we believe other parameter combinations would produce a trend within the variability of the four cases. I hope you have understood our logic.

(5) As I mentioned in last response, we will reach you by contacting the editor for next step.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 18389, 2010.