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## ***Interactive comment on* “Estimation of cloud condensation nuclei concentration from aerosol optical quantities: influential factors and uncertainties” by J. Liu and Z. Li**

**J. Liu and Z. Li**

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Dear Dr. Anne Jefferson

The authors appreciate very much your insightful and constructive comments on this study. All the comments are highly valuable for us to improve the quality of our study. We will address all the comments together with others once we receive a formal notice from the editor. Here, we would like to address your major comment concerning data quality to assure you and potentially other reviewers that we did not use any bad data as you pointed out.

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1. Much of my concerns about this paper centers on incorrect use of the data. The CCN edited and corrected data starts May 2007 not as stated 2006.09 in the paper. Given this error I wonder if the other data sets used final edited and corrected or raw data. The final datasets are either b1 or c1 data in the ARM archive. The nephelometer data during GVAX had an incorrect calibration value in the a1 data due to a bad tank of CO<sub>2</sub> gas. This calibration was repeated at the end of the field campaign and applied to past data in the b1 data set. Similar instrument problems are prevalent in all the data sets as is typical with remote measurements in regions with limited resources. Caution is needed when using the data to consult the data quality and monthly system reports for further removal of suspect data.

Reply: We noticed that there are several versions of data from the Aerosol Observing System (AOS) in the ARM archive and we have double checked the data thoroughly for all the sites we used here one by one.

For the SGP site, the datasets we used are “sgpnoaaosC1.b0.” and “sgpnoaaosC1.b1” version. The former is from 2 Jul 1996 to 17 May 2007 and the latter is from 19 May 2007 to March, 2013 (up to now) in the ARM archive. The data have 1-min time resolution and mentor-QC applied already. Because there are no CCN data available (-9999 in the data file) before 17 May, 2007 in the “sgpnoaaosC1.b0.” data set, the bad data priori to this day were automatically excluded. Noted that, since we matched several data sets based on the observation time, a period void of valid data for any single dataset would be excluded from subsequent analyses. As such, the effective data range of the matched data is shorter than the data range listed in table 1. We will clarify this in the revised manuscript.

For the data during the GVAX period, we did not use the “a1” data but your quality-assured “pghnoaaosM1.b1” data, which is the aerosol data measured by AOS with 1-min time resolution and mentor-QC applied.

Likewise, we used the datasets named “grwnoaaosM1.b1” for GRW, “fkb-

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noaaaosM1.b1” for FKB and “nimnoaaaosM1.b1.” for NIM. They are the aerosol properties measured by AOS with 1-min time resolution and mentor-QC applied already.

Again thank you!

Sincerely yours,

J. Liu and Z. Li

September 12, 2013

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 23023, 2013.

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