

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

**Anonymous Referee #2**

Received and published: 11 September 2013

General comments: The paper “Estimation of cloud condensation nuclei concentration from aerosol optical quantities: influential factors and uncertainties” by J. Liu, et al. 2013 analyzes a large set of data observed at diverse regions of the world. The table and figure are clear. However, my major concern is that the paper did not clearly outline “what are the scientific assumptions of analysis and data selection?” For example, CCN concentration used in this paper is  $S=0.4\%$ , which is commonly used for convective clouds and may not atmospherically relevant to each sampling site. Because the goal of this paper is to provide more general/practical relationship between CCN and aerosol optical quantities, the data analysis at  $S=0.4\%$  only will hinder the effort. In addition, it is

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good to be consistent with other researches, but author should provide more legitimate reasons for data selection.

Minor comments:

Page 23030, Line10-15: The largest mean alpha were observed at FKB site, where AOD and alpha were retrieved from MFRSR. How does the retrieval contribute to the uncertainty of alpha value? Are the comparison among those sites fair? Page 23031, Line 12, section 3.1.1: The section discussed the well correlation between AOD and CCN0.4 for SGP, GVAX and FKB, but did not mention the poor correlation for GRW site at all. Why is the correlation coefficient so low for GRW site? Is it because data selection? Analysis assumption? Or marine environment? Again in section 3.1.2 and section 3.2, lower correlation coefficients are also observed in Fig2 and Fig 4 for GRW site. Further discussion or explanations are needed.

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

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