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Supplement of

A long-term study of aerosol–cloud interactions and their radiative effect at the Southern Great Plains using ground-based measurements

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Shinozuka et al., 2015 propose a new methodology to estimate CCN at a given supersaturation using light scattering measurements. To test the robustness of our results in the body of the text obtained using the aerosol index $A_i$, we now explore use of the Shinozuka et al. CCN proxy ($CCN_i$). We find that the results are similar to the results obtained with $A_i$, as shown in Figures S1a-c, for a supersaturation of 0.6%. The distribution of daily correlation between $r$CRE and $CCN_i$ is centered at 0.02. Also, the scatter plot of the correlation between $r$CRE and CCN vs. the correlation of LWP and $CCN_i$ concentration shows a positive correlation of 0.42. Thus the main conclusions of our paper regarding the importance of the aerosol are robust with respect to these two CCN proxies.

Figure S1: a) Relative cloud radiative effect ($r$CRE) as a function of liquid water path (LWP) colored by CCN concentration, b) daily distribution of the correlation between $r$CRE and CCN, and c) correlation between $r$CRE and CCN versus the correlation between LWP and CCN. To calculate CCN concentration, a supersaturation of 0.6% was considered.
Figure S2: Joint distribution of rCRE and LWP for the distribution shown in Figure 3.

Figure S3: Joint distribution of cloud albedo and LWP for fully overcast conditions (f_c = 1) and when cos(\(\theta_0\)) > 0.6 (that is, for the data shown in Fig. 5).
References