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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_s). 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 rCRE and CCN_s is centered at 0.02. Also, the scatter plot of the correlation between rCRE and CCN vs. the correlation of LWP and CCN_s 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.

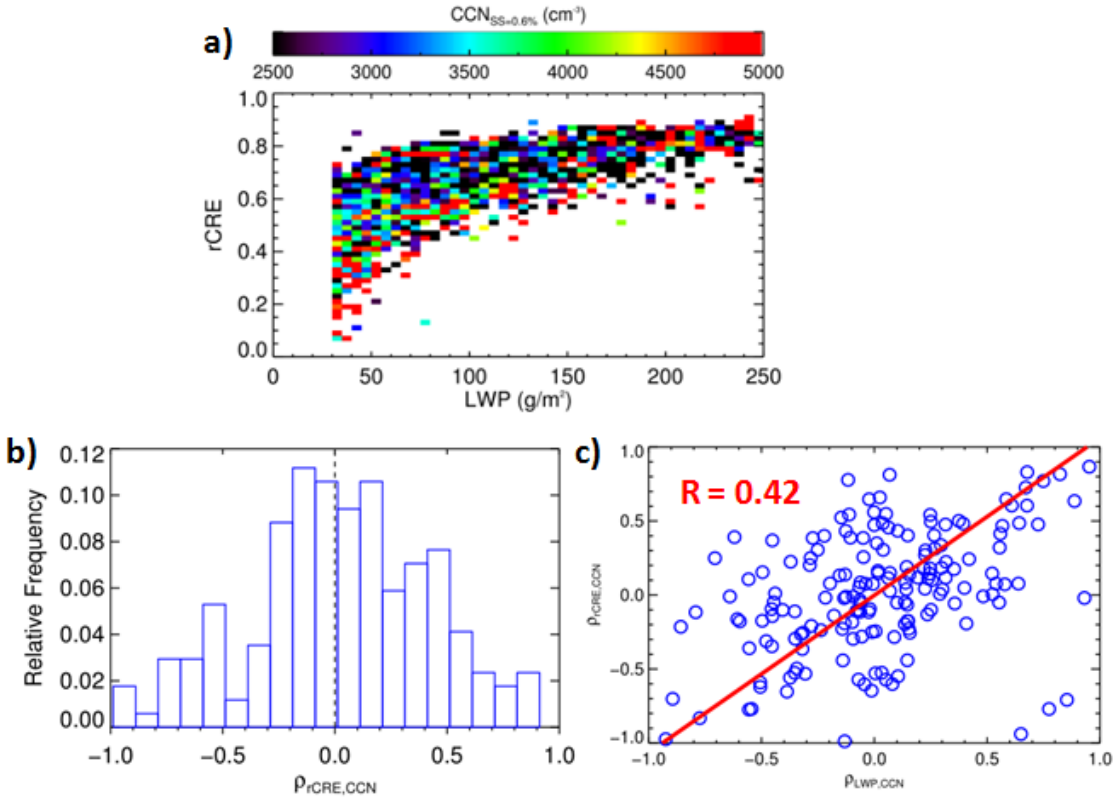

Figure S1: a) Relative cloud radiative effect (rCRE) as a function of liquid water path (LWP) colored by CCN concentration, b) daily distribution of the correlation between rCRE and CCN, and c) correlation between rCRE and CCN versus the correlation between LWP and CCN. To calculate CCN concentration,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

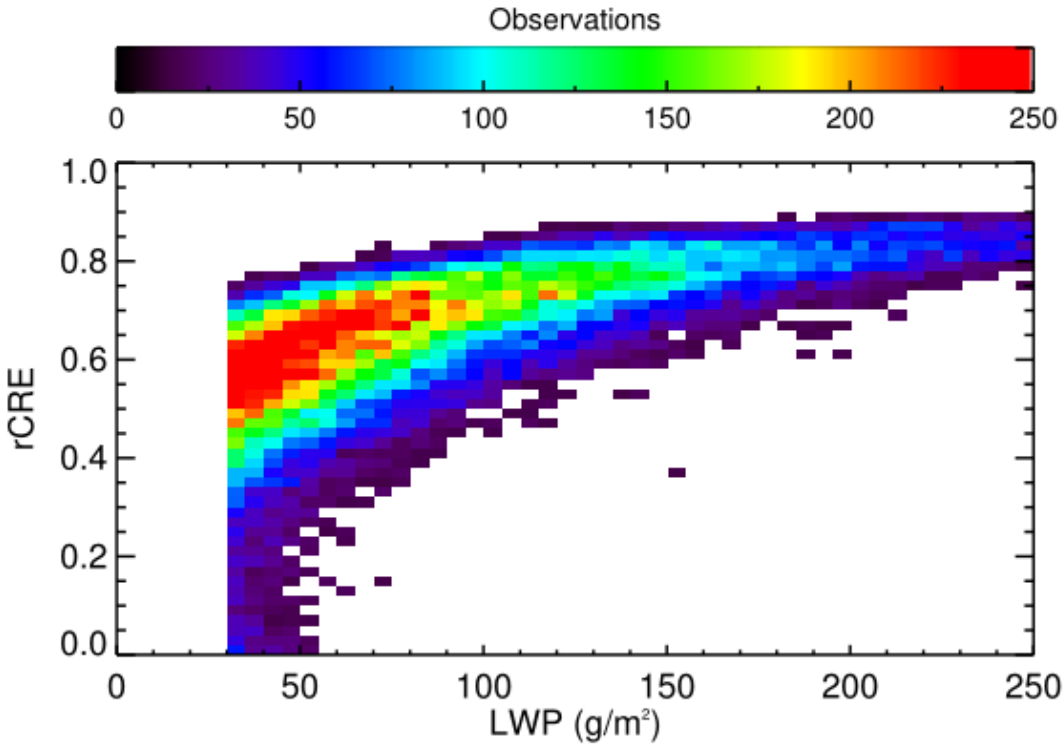

Figure S2: Joint distribution of rCRE and LWP for the distribution shown in Figure 3.

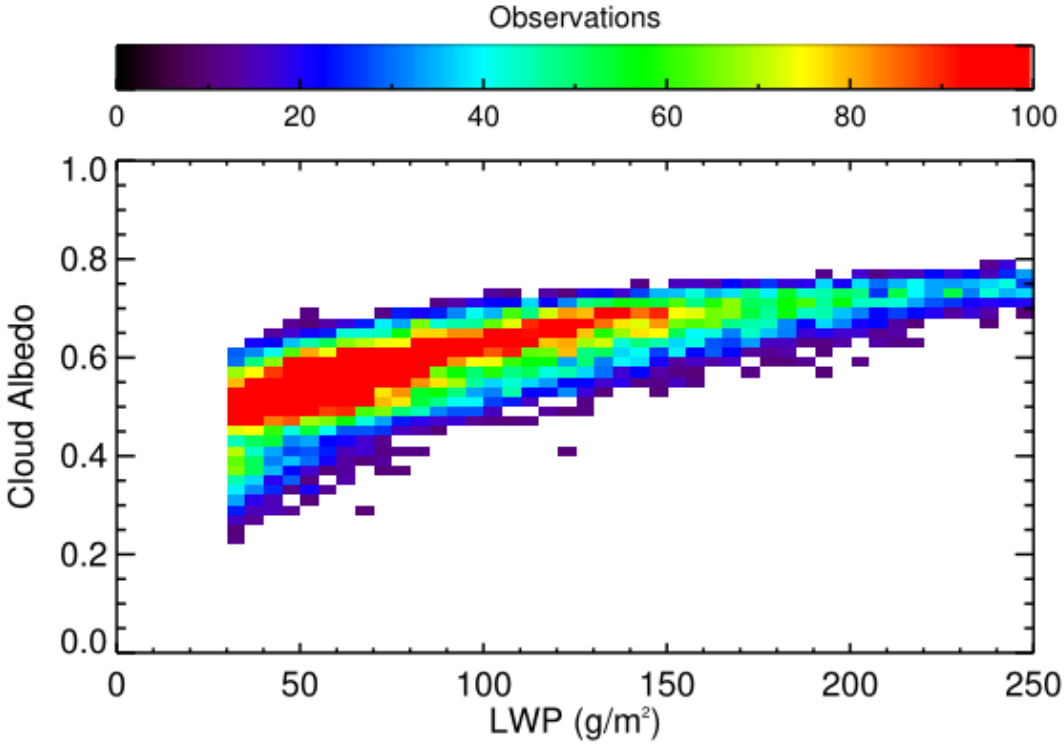

Figure S3: Joint distribution of cloud albedo and LWP for fully overcast conditions (f_c = 1) and when $\cos(\theta_0) > 0.6$ (that is, for the data shown in Fig. 5).

References

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