



Supplement of

Assessment of dicarbonyl contributions to secondary organic aerosols over China using RAMS-CMAQ

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1. The comparisons of temperature, relative humidity, wind speed, wind direction and $PM_{2.5}$ between simulations and observations at 12 stations duirng the two analyzed episodes.

1) Fig. S1 Temperature:



2) Fig. S2 Relative Humidity:

Episode 1:



3) Fig. S3 Wind Speed: Episode 1:



4) Fig. S4 Wind Direction: Episode 1:



Episode 2:



5) Fig. S5 PM_{2.5}:

Episode 1:



2. The comparisons of cloud water path (CWP), cloud fraction (CF) and precipitation (PREC) between simulations and observations duirng the two analyzed episodes.

Fig. S6 Observed and simulated distributions of the cloud fraction and the precipitation during the two episodes (left-hand panels: observation; right-hand panels: results of simulations).



Fig. S7 Differences in the distributions between the observed and modeled (observed – modeled) cloud water path, cloud fraction and precipitation during the two episodes.

