

Supplementary Material

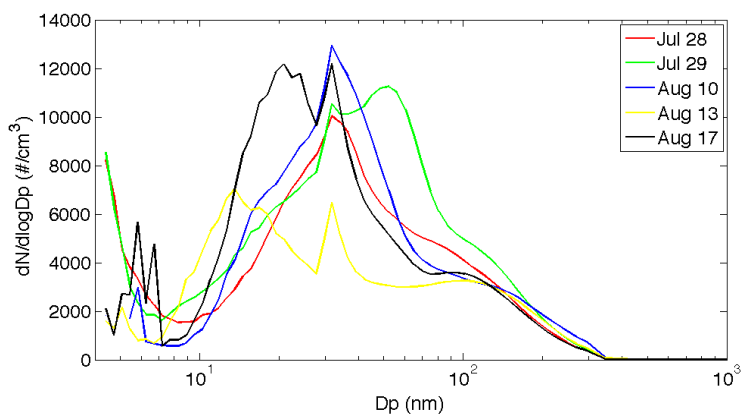


Figure S1: Average number size distributions of small particles during the APE days.

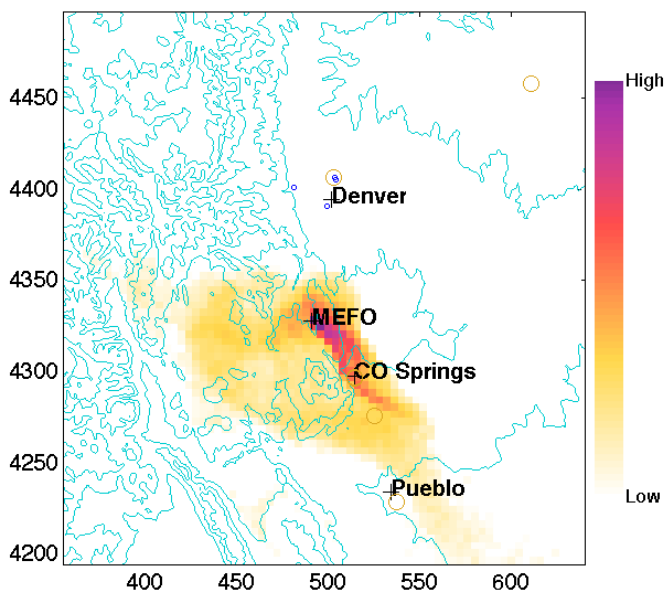


Figure S2: Back-trajectories during August 13, 2013, from 13-18 MST.

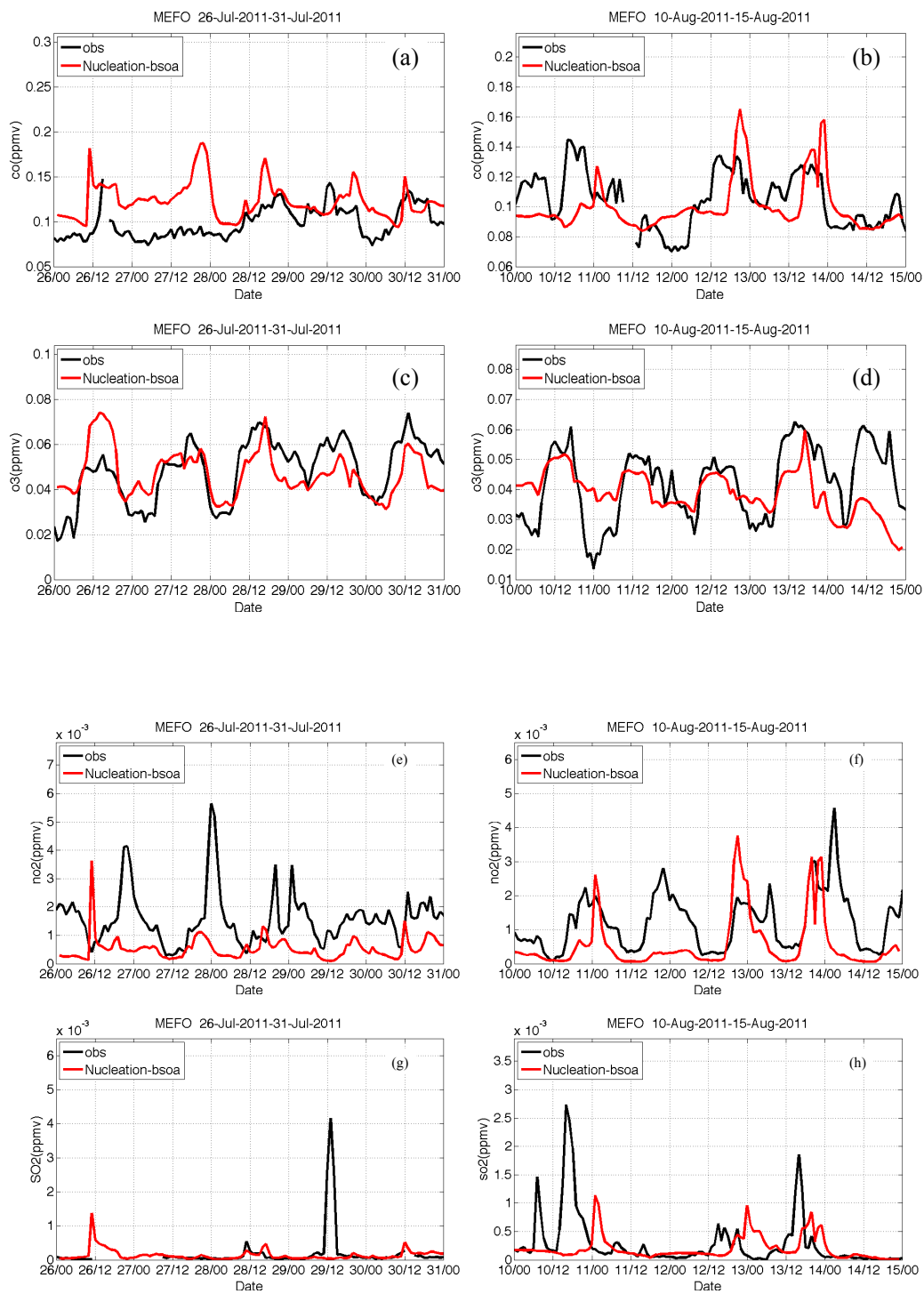


Figure S3: Time series comparison of CO, O₃, NO₂ and SO₂ mixing ratios between measurements and simulations (Nucleation-bsoa run) during two periods 26-30 July (left column) and 10-17 August (right column). The 2nd model layer (~34 m above the ground) is used for comparisons with the measurements.

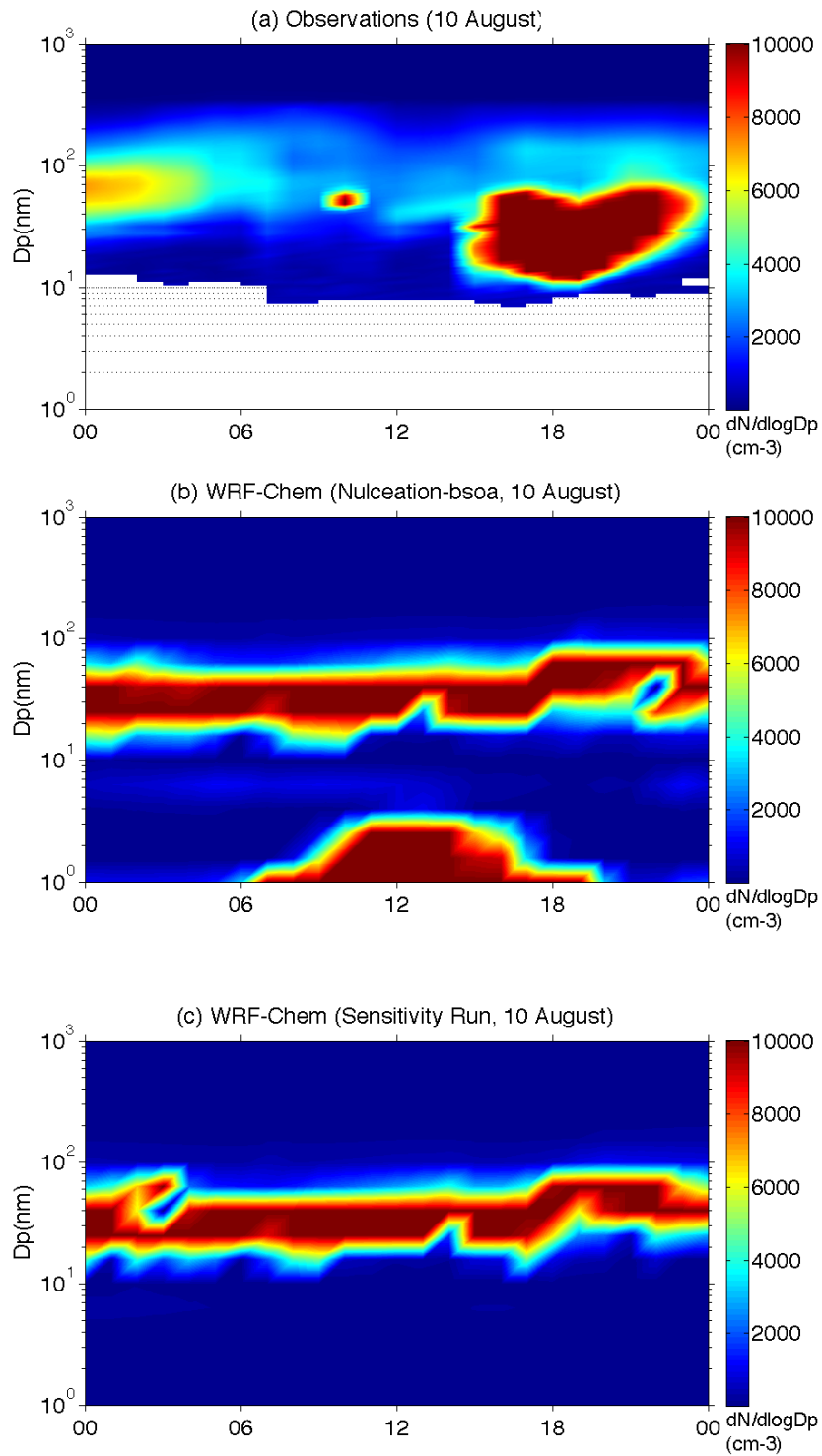


Figure S4: Temporal evolution of (a) observed and (b) simulated (Nucleation-bsoa) number size distributions. The results of the sensitivity study that includes binary nucleation parameterization above the PBL, and has no nucleation parameterization within the PBL, are shown in (c).

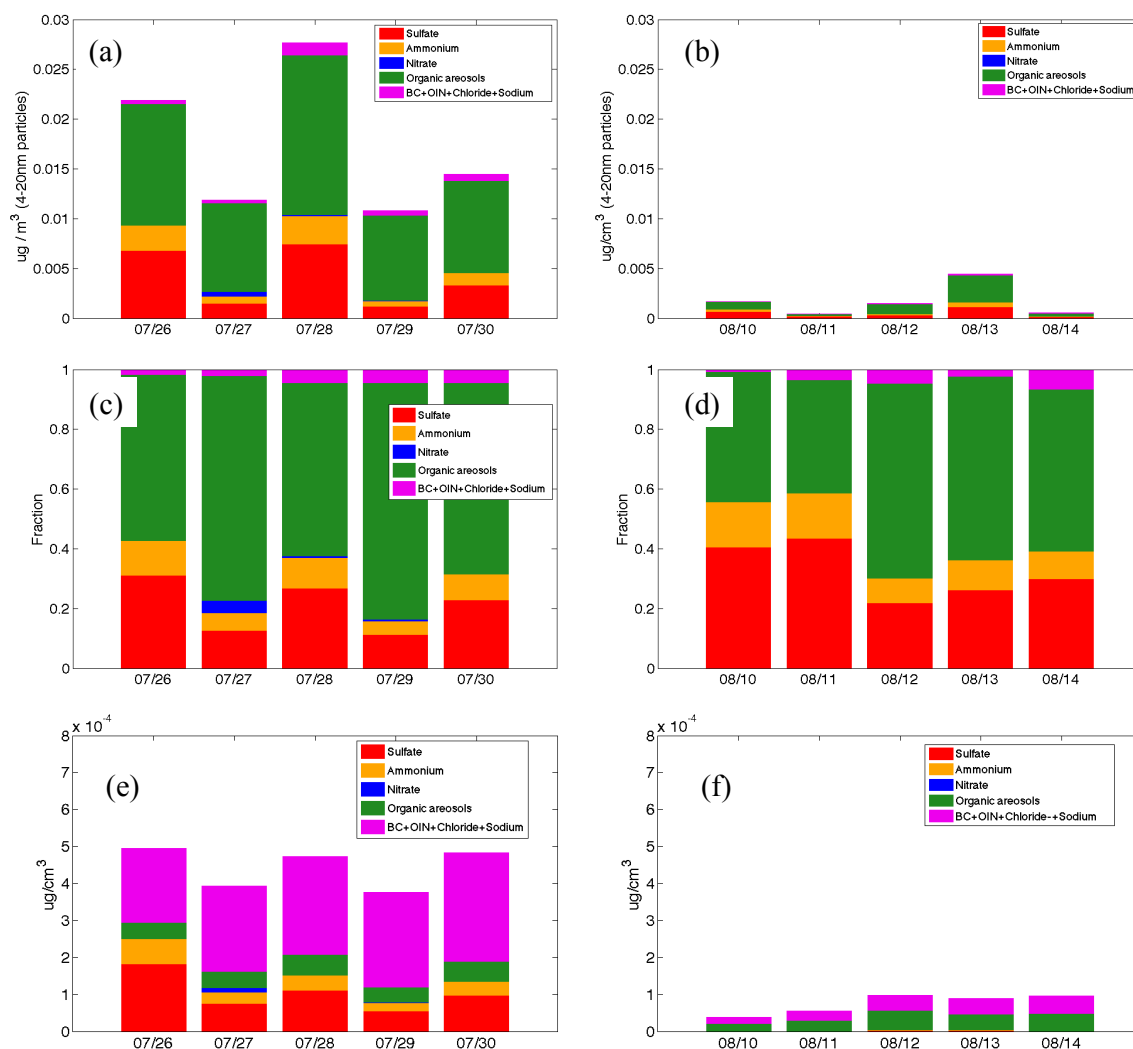


Figure S5. Predicted surface (a) mass concentrations and (b) composition fractions for Aiken-mode aerosols (4-20 nm) during the field study period. Simulations are based on the Nucleation-bsoa model run. (c) Predicted surface mass concentrations for Aiken-mode aerosols (4-20 nm) during the field study period. Simulations are based on the extreme Nucleation-off model run.

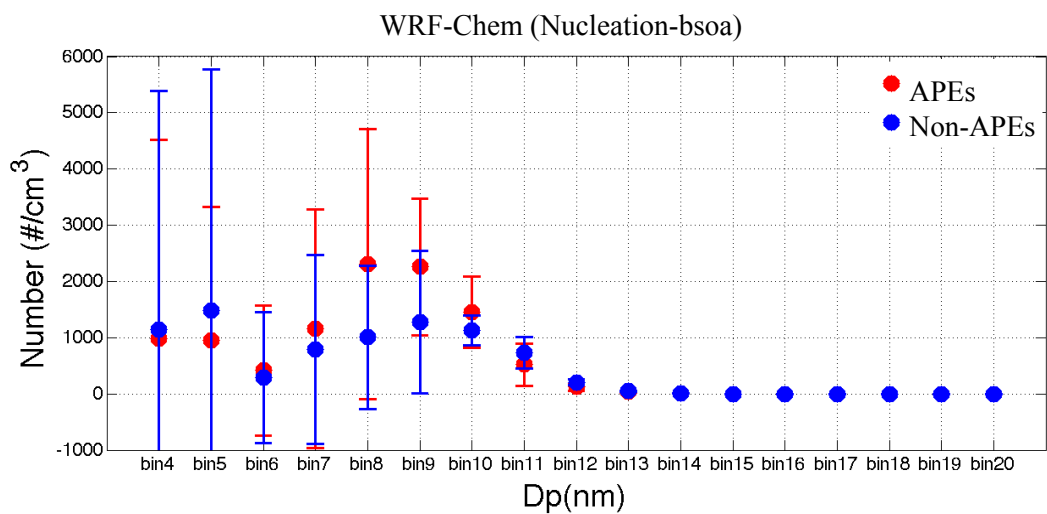


Figure S6: WRF-Chem simulations of the number size distribution (from 4.4-150 nm) during APEs and non-APEs for the Nucleation-bsoa run.