Supporting Information for "Influence of convection on the upper tropospheric O_3 and NO_x budget in southeastern China"

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Figure S1. to S6.

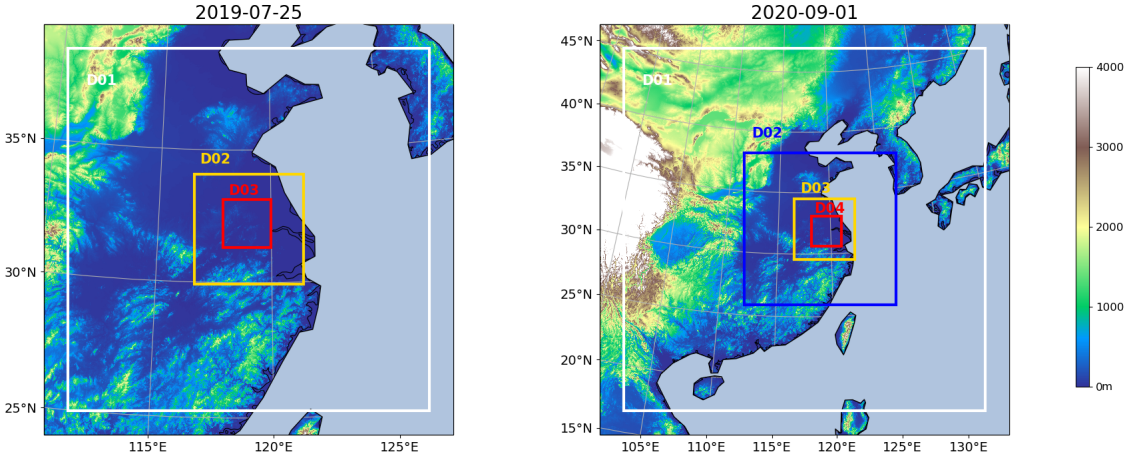

Figure S1. Domain and terrain height (m) of the WRF-Chem simulations for the 2019 and 2020 cases. The horizontal grid resolution of domains for the 2019 case is 15 km (D01), 3 km (D02) and 0.6 km (D03). For the 2020 case, it is 27 km (D01), 9 km (D02), 3 km (D03), and 1 km (D04).

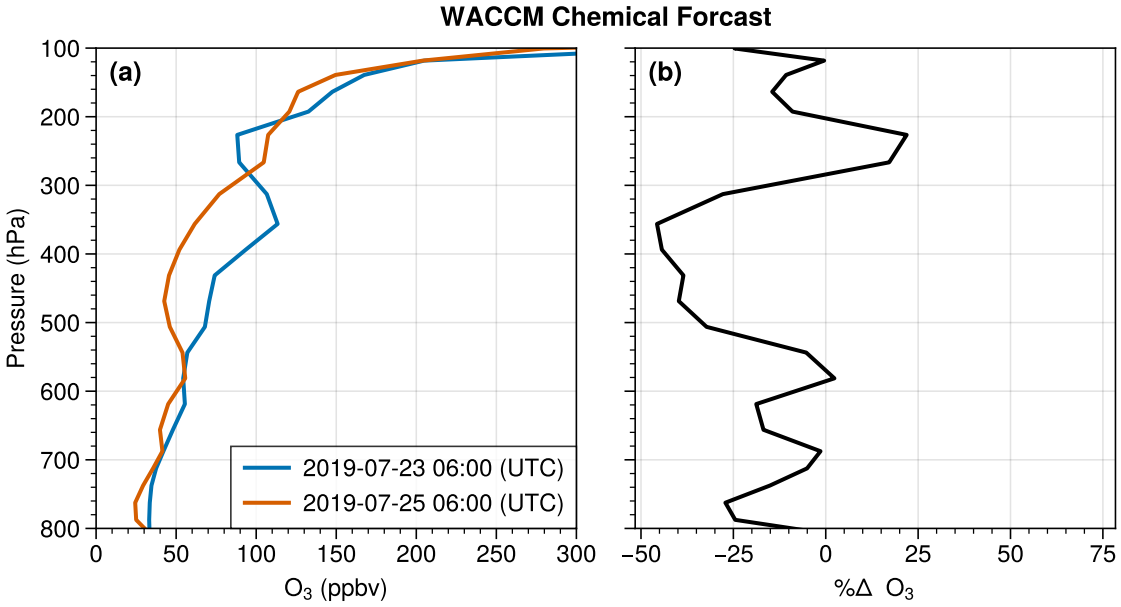

Figure S2. (a) Regional mean (118.5°E – 119.5°E, 31.5°N – 32.5°N) preconvection (blue) and postconvection (orange) O_3 profiles from the 6-hour WACCM forecasts. (b) The percent difference of O_3 profiles in (a).

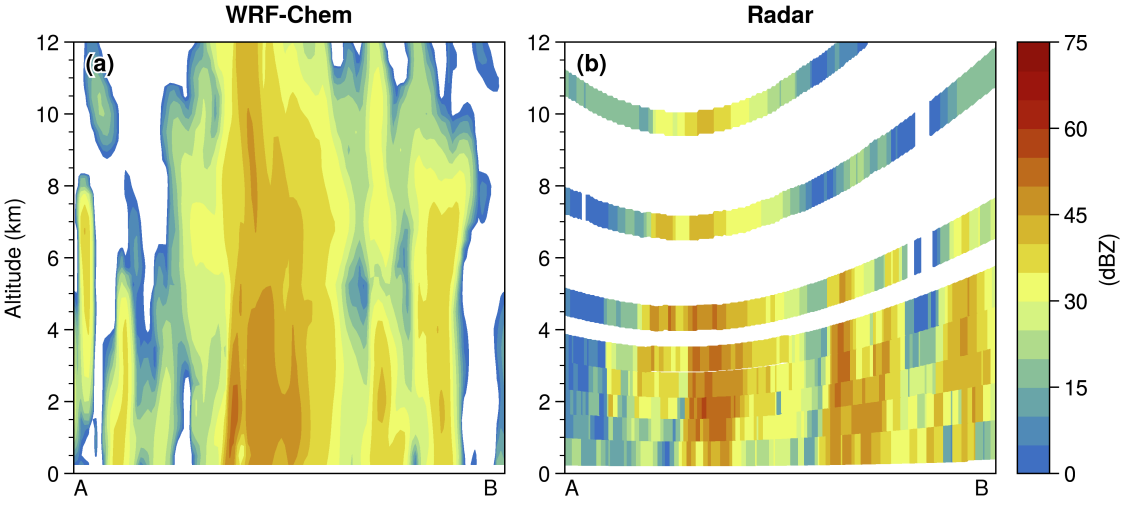

Figure S3. Vertical cross sections of (a) WRF-Chem simulated and (b) observed radar reflectivity fields along the transect lines (AB) in Fig. 2 for 25 July, 2019.

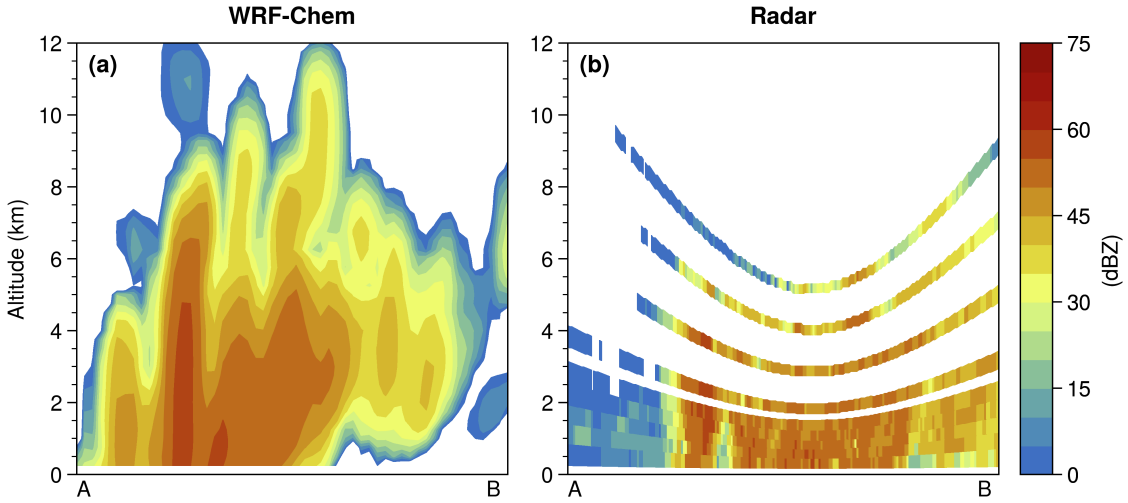

Figure S4. Same as Figure S3 but for the case on 01 September 2020.

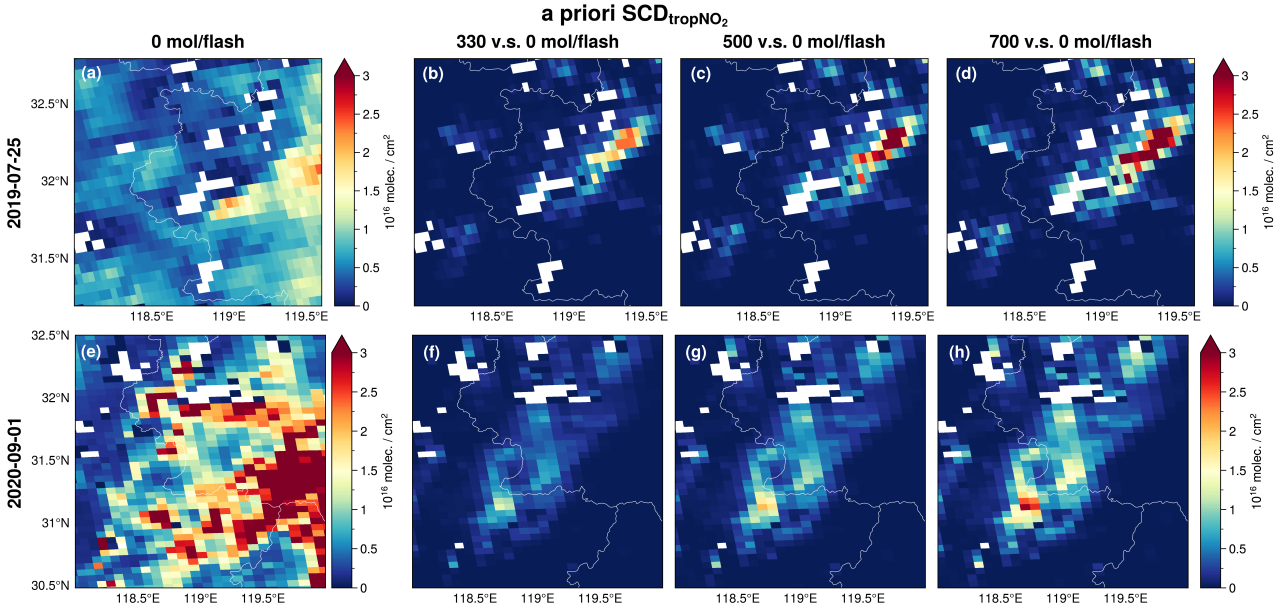

Figure S5. The tropospheric NO_2 slant column density (SCD_{tropNO_2}) recalculated using the WRF-Chem results with different lightning NO settings: (a, e) 0 mol/flash, (b, f) 330 mol/flash, (c, g) 500 mol/flash and (d, h) 700 mol/flash.

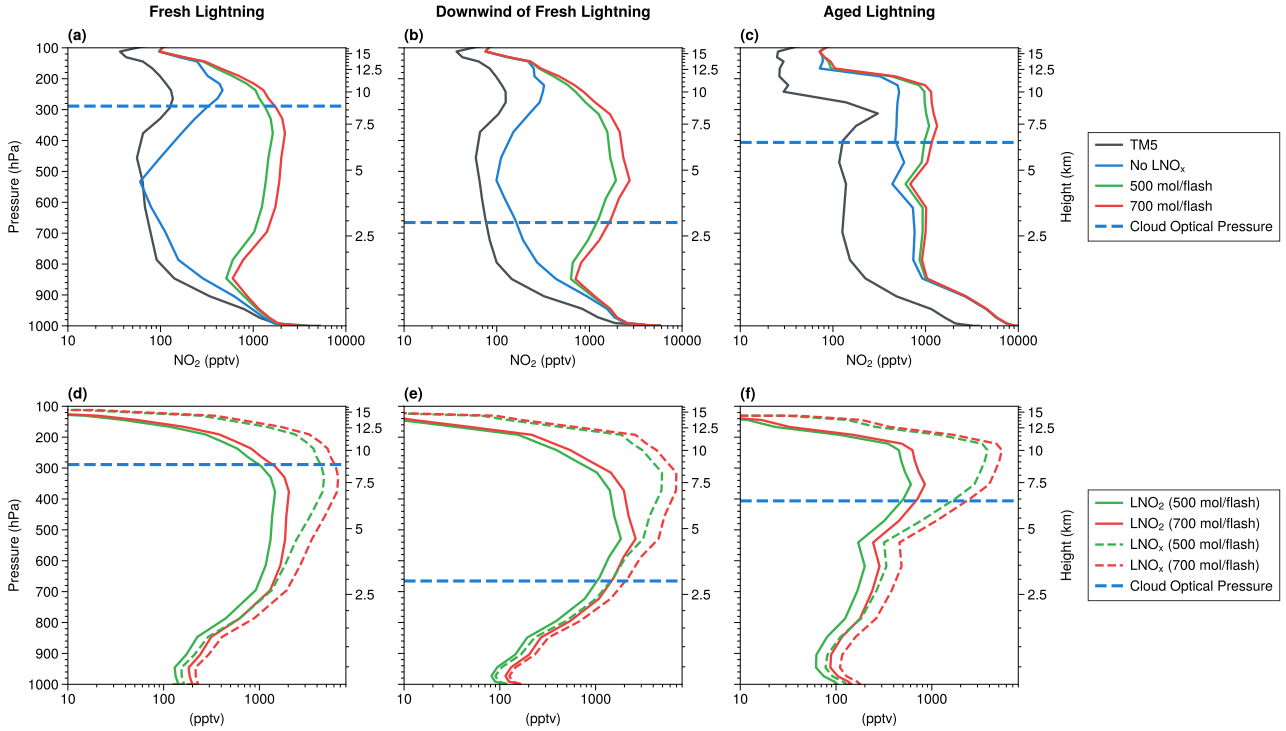

Figure S6. Profiles with different lightning NO productions at TROPOMI overpass time over three regions (fresh lightning, downwind of fresh lightning, and aged lightning). (a–c) The NO_2 profiles compared with the official TM5 a priori NO_2 profile. (d–f) The lightning NO_2 and NO_x profiles. The blue dashed line is the cloud optical pressure detected by TROPOMI.