Supplement of

WRF-GC (v1.0): online coupling of WRF (v3.9.1.1) and GEOS-Chem (v12.2.1) for regional atmospheric chemistry modeling – Part 1: Description of the one-way model

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Figure S1: Six-day average values of simulated (filled contours) and observed (symbols) 2-m air temperature (upper panel), surface relative humidity (middle panel), and 10-m wind speed (bottom panel) during January 22-27, 2015: (a,c,e) meteorological variables used to drive the GEOS-Chem Classic nested-China simulation (i.e., the GEOS-FP dataset); (b,d,f) meteorological variables simulated by the WRF-GC model. Surface meteorological measurements at 367 sites were obtained from the U.S. National Climate Data Center (https://gis.ncdc.noaa.gov/maps/ncei/cdo/hourly).
Figure S2: Assessments of the hourly meteorological variables simulated by the WRF-GC model (red dots) and those used to drive the GEOS-Chem Classic nested-China simulation (i.e., the GEOS-FP dataset, black dots) against hourly measurements at 34 surface sites during January 22-27, 2015: (a) 2-m air temperature, (b) surface relative humidity, (c) 10-m U-wind, and (d) 10-m V-wind. Green, black, and blue dashed lines indicate contours of the normalized centered root-mean-square differences (RMSD), the ratios of simulated versus observed standard deviations, and the Pearson correlation coefficients, respectively. Surface meteorological measurements were obtained from the U.S. National Climate Data Center (https://gis.ncdc.noaa.gov/maps/ncei/cdo/hourly). The 34 sites were selected (out of a total 367 sites) because hourly measurements were publicly-available at these sites.
Figure S3: Scalability test of the WRF-GC model on the Amazon Web Services using up to 64 nodes and 4,608 cores. The simulation domain was over the continental U.S. at 5 km × 5 km resolution (950 × 650 atmospheric columns), using 10-second dynamical time step and 5-minute external chemical time step.