CMAQ Model Configuration for the CAIR Modeling Platform

1. CMAQ Modeling Platform

Model version: CMAQ version 4.3 (also referred as PAR5 version)

Model dimensions: 148 * 112 * 14 (x * y * z)

Model resolution: 36 x 36 km horizontal grid, 14 logarithmic structure vertical layers (See Below)

Model domain: Nationwide domain centered at 97 degrees with transects at 33 and 45 degrees on a Lambert conformal map projection

Model vertical layer structure:

14 layers	Sigma	Height (m)	Pressure (mb)
0	1.00	0	1000
1	0.995	38	995.5
2	0.990	77	991
3	0.980	154	982
4	0.960	310	964
5	0.940	469	946
6	0.910	712	919
7	0.860	1130	874
8	0.800	1657	820
9	0.740	2212	766
10	0.650	3108	685
11	0.550	4212	595
12	0.400	6154	460
13	0.200	9626	280
14	0.000	15676	100

Model dates: 1/1/2001 - 12/31/2001

Model initialization:

- CMAQ was run as quarterly simulations each with a 10 days ramp-up (e.g. the model run for the 1st quarter: January, February and March 2001 started on December 22, 2000)

2. CMAQ Model Configuration

Gas-Phase Chemical Mechanism: CB-IV with updated Isoprene chemistry

Chemical Solver: Euler Backward Iterative (EBI) scheme

PM Module:

    Three-mode approach: One coarse mode, two fine modes with variable standard deviations

    Inorganic PM module: ISORROPIA

    Organic PM module: SOA module based on Odum/Griffin et al., (1997, 1999)

Advection Scheme (vertical and Horizontal): Piecewise Parabolic Method (PPM) scheme

Vertical Diffusion: K-Theory Eddy diffusivity scheme

Dry Deposition: M3DRY module, modified RADM scheme with Pleim-Xiu land surface model

Aqueous Chemistry: RADM Bulk scheme

Cloud Scheme: RADM Cloud scheme

Vertical Coordinate: Terrain-following Sigma coordinate