Supplementary Material

GPU-HADVPPM4HIP V1.0: higher model accuracy on China's domestically GPU-like accelerator using heterogeneous compute interface for portability (HIP) technology to accelerate the piecewise parabolic method (PPM) in an air quality model (CAMx V6.10)

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Figure S1. O_3 concentrations outputted by CAMx model for Fortran (F), HIP C(HIP), and HIP C with OpenMP (HIP_OMP) versions. Panels (a) is from Fortran version. Panels (b) is from HIP C version. Panels (c) is from HIP C with OpenMP version. Panels (d) is the output concentration differences of Fortran and HIP C versions. Panels (e) is the output concentration differences of HIP C and HIP C with OpenMP versions. Panels (f) is the output concentration differences of Fortran and HIP C with OpenMP versions.

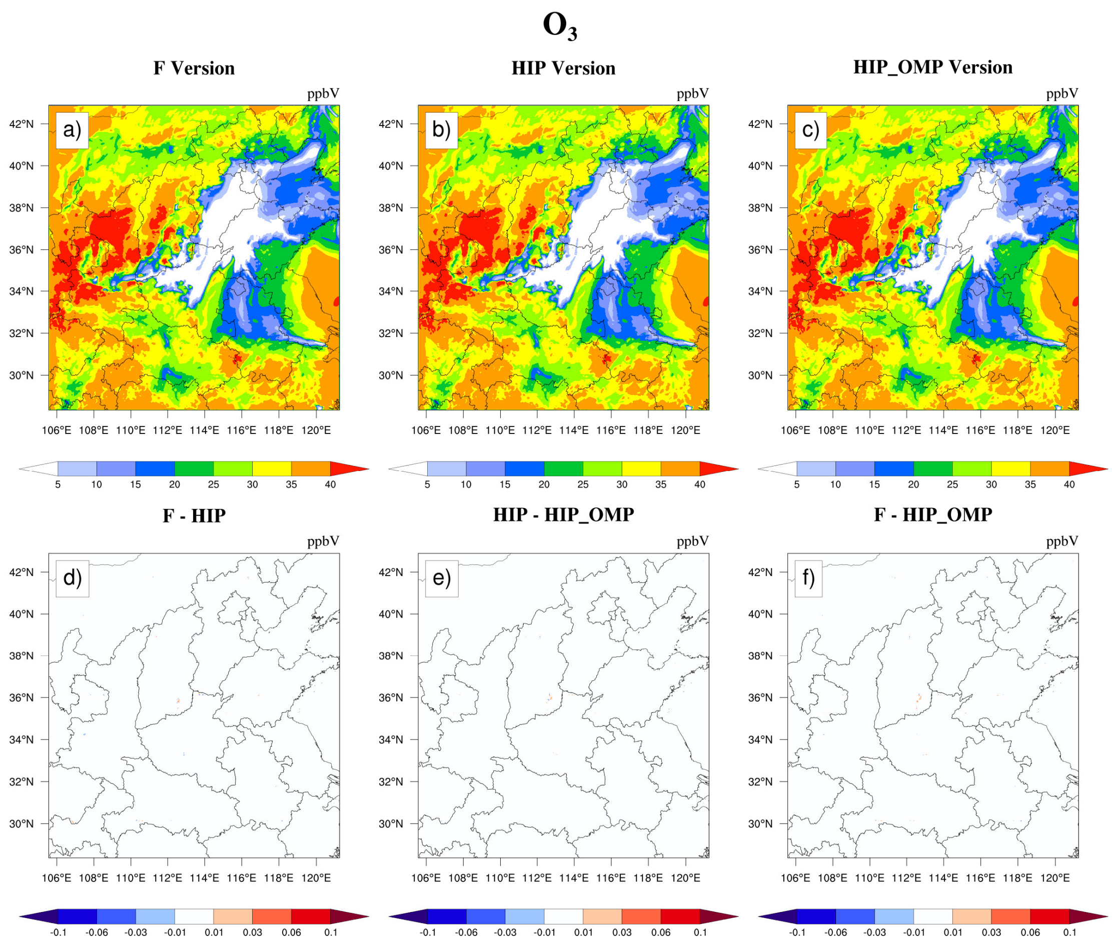

Table S1. The physical and chemical numerical methods selected during CAMx model simulation.

Process	Numerical Methods
Horizontal advection	PPM (Colella and Woodward, 1984)
Vertical diffusion	K-theory 1st order closure
Aqueous-phase oxidation	Regional Acid Deposition Model (RADM-AQ, (Chang et al., 1987))
Inorganic aerosol thermodynamic partitioning	ISORROPIA (Nenes et al., 1999)
Gas-Phase Chemistry	Carbon Bond 2005 (Yarwood et al., 2005) EBI solver (Hertel et al., 1993)

Dry deposition	Resistance model for gases (Zhang et al., 2003) and aerosols (Zhang et al., 2001)
Wet deposition	Scavenging model for gases and aerosols (Seinfeld et al., 1998)

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