



Supplement of

**Development of the CMA-GFS-AERO 4D-Var assimilation system
v1.0 – Part 1: System description and
preliminary experimental results**

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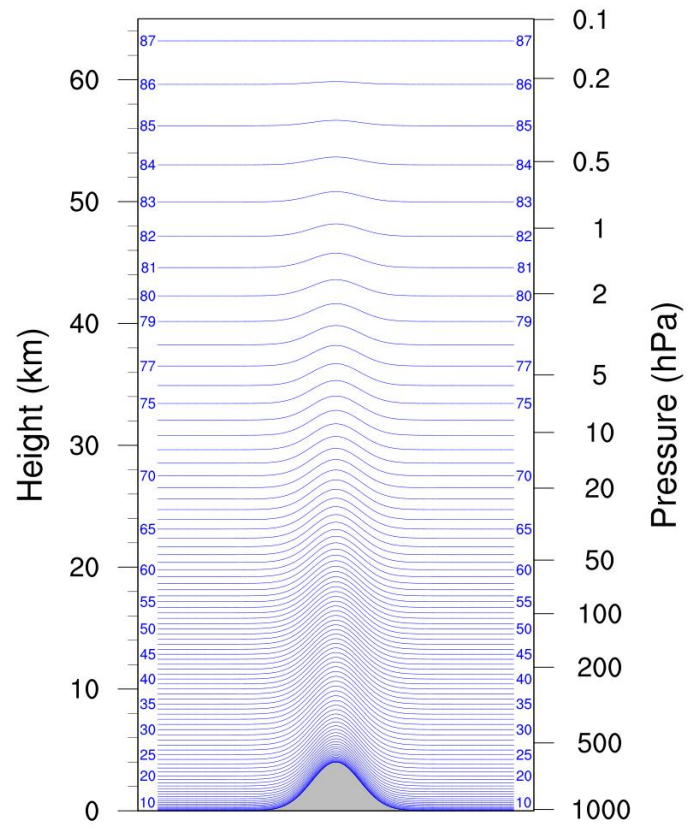


Figure S1. Correspondence between the model layer and the altitude in CMA-GFS.

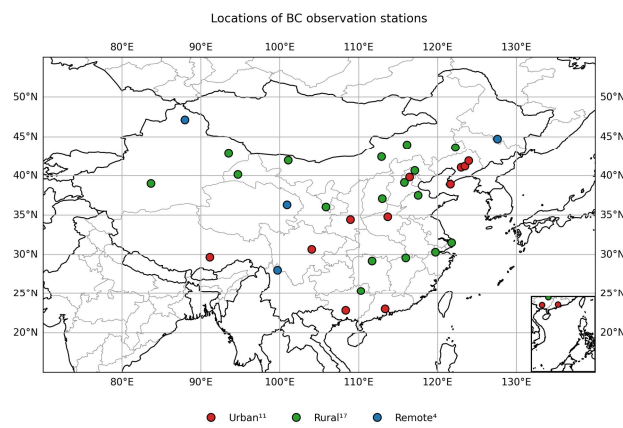


Figure S2. Distribution of BC surface observation stations.

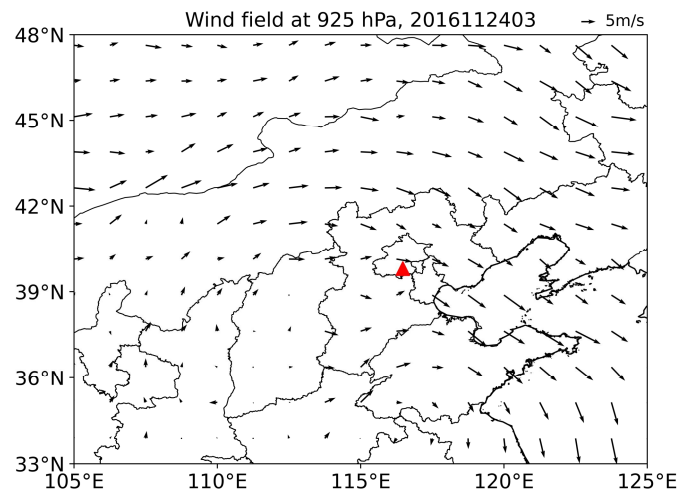


Figure S3. The wind field at 925hPa in the single-point observation experiment, and the red triangle represents the ideal observation location (116.47°E, 39.8°N).

Table S1. The atmospheric observation data used in the CMA-GFS-AERO 4D-Var experiment.

Observation type	Observation element
TEMP	Temperature, wind, and relative humidity
SYNOP	Air pressure
SHIP	Air pressure
AIREP	Wind
SATOB	Wind
SCATWIND	Wind
GNSSRO	Refractivity
NOAA15 AMSU-A	Radiance
NOAA18 AMSU-A and AMSU-B	Radiance
NOAA19 AMSU-A and AMSU-B	Radiance
METOP-A AMSU-A and AMSU-B	Radiance
METOP-B AMSU-A and AMSU-B	Radiance
NPP ATMS AMSU-A	Radiance