



## **Evaluation and intercomparison of air quality forecasts over Korea during the KORUS-AQ campaign**

Seungun Lee (1), Rokjin J. Park (1), Soontae Kim (2), Chul H. Song (3), Cheol-Hee Kim (4), and Jung-Hun Woo (5)

(1) Seoul National University, Seoul, South Korea (hb3099@hotmail.com), (2) Ajou University, Suwon, South Korea, (3) Gwangju Institute of Sciences and Technology, Gwangju, South Korea, (4) Pusan National University, Busan, South Korea, (5) Konkuk University, Seoul, South Korea

We evaluate and intercompare ozone and aerosol simulations over Korea during the KORUS-AQ campaign, which was conducted in May-June 2016. Four global and regional air quality models participated in the campaign and provided daily air quality forecasts over Korea to guide aircraft flight paths for detecting air pollution events over Korean peninsula and its nearby oceans. We first evaluate the model performance by comparing simulated and observed hourly surface ozone and PM<sub>2.5</sub> concentrations at ground sites in Korea and find that the models successfully capture intermittent air pollution events and reproduce the daily variation of ozone and PM<sub>2.5</sub> concentrations. However, significant underestimates of peak ozone concentrations in the afternoon are also found in most models. Among chemical constituents of PM<sub>2.5</sub>, the models typically overestimate observed nitrate aerosol concentrations and underestimate organic aerosol concentrations, although the observed mass concentrations of PM<sub>2.5</sub> are seemingly reproduced by the models. In particular, all models used the same anthropogenic emission inventory (KU-CREATE) for daily air quality forecast, but they show a considerable discrepancy for ozone and aerosols. Compared to individual model results, the ensemble mean of all models shows the best performance with correlation coefficients of 0.73 for ozone and 0.57 for PM<sub>2.5</sub>. We here investigate contributing factors to the discrepancy, which will serve as a guidance to improve the performance of the air quality forecast.