

Model inter-comparison for evaluation on source sensitivities of atmospheric pollutants over East Asia

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Atmospheric pollutants were simulated by using two regional CTMs, WRF-Chem and WRF/CMAQ and a global CTM, CHASER over East Asia for the year 2005. Simulated surface O₃ over Japan by WRF/CMAQ was higher than that by CHASER especially in summer, and overestimated observed O₃ at EANET monitoring sites. Contributions from 5 source regions; north China(CHN), central China(CHC), and south China(CHS), Korea(KRE), and Japan(JPN) on 6 areas on these regions were evaluated based on sensitivity simulations with 20% reduction in anthropogenic emissions. These models resulted that the 20% emission reductions on CHC would gain 0.8% decrease of surface O₃ over Central Japan in spring, and that was comparable to the O₃ decrease of 0.8-0.9% over Central Japan by the 20% emission reductions on JPN. As for the summer case by using CHASER, the O₃ decreases of 0.6% and 1.6% over Central Japan by 20% emission reductions over CHC and JPN, respectively. On the other hand, the regional CTMs, WRF-Chem and WRF/CMAQ, resulted 0.9% (CHC emission reduction) and 3.1% (JPN) O₃ decreases and 0.7%(CHC) and 2.4% (JPN) O₃ decreases, respectively, and that were 1.2-1.9 times higher than those by CHASER.

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