



Effects of dry deposition on O₃ concentrations in surface air over East Asia

Rokjin Park (1), Seungkyu Hong (1), Jung-Hun Woo (2), Ki-Chul Choi (2), Christopher Loughner (3), Saewung Kim (4), and Hyeong-Ahn Kwon (1)

(1) Seoul National University, School of Earth and Environmental Sciences, Seoul, Korea, Republic Of (rjpark@snu.ac.kr), (2) Department of Advanced Technology Fusion, Konkuk University, Seoul, Korea, (3) NASA Goddard Space Flight Center, Greenbelt, Maryland, USA, (4) Department of Earth System Science, University of California-Irvine, Irvine, USA

Ozone, one of key air pollutants, affects human health and vegetation growth in surface air where its concentrations are determined by complex NO_x-VOC photochemistry and loss processes. We use a 3-D regional atmospheric chemistry transport model (WRF-Chem) to understand processes determining O₃ in East Asia, in particular, focusing on the dry deposition process that has a large uncertainty because of insufficient observational and numerical studies in East Asia. Here we examine two widely used dry deposition schemes: Weseley versus M3DRY schemes used in WRF-Chem and CMAQ models, respectively. We also conduct a comparison of simulated versus observed dry deposition velocities at a BEACHON-ROCS site in the United States to evaluate the dry deposition schemes. Finally model simulations with different surface types are conducted to examine the sensitivity of ozone simulations to the surface condition. Our results show considerable differences in O₃ concentrations with different dry deposition calculations dependent on parameterization schemes and surface types, indicating high sensitivity of model simulation to dry deposition and its importance for air quality models.