



Characterization of tropospheric ozone based on lidar measurement in Hangzhou, East China during the G20 Leaders' Summit

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Owing to the G20 (Group of Twenty Finance Ministers and Central Bank Governors) Leaders' Summit (Sep.5th-6th, 2016), a series of strict air quality control measures were implemented in Hangzhou and its surrounding regions from Aug.26th to Sep.6th. A differential absorption lidar was employed to monitor tropospheric ozone in urban Hangzhou during a campaign from Aug. 24th to Sep. 10th, and the satellite-based NO₂ VCDs and HCHO VCDs in the troposphere were also retrieved using the Ozone Monitoring Instrument (OMI). During our campaign, six O₃ pollution events, which were determined according to the National Ambient Air Quality Standard of China (GB-3095-2012), and two stages with rapid reduction of O₃ concentration on Aug. 26th and Sep.4-6th were observed. The temporal variation tendency of O₃ concentrations was well reproduced by the Weather Research and Forecasting model coupled with chemistry (WRF-Chem). Typical cases with the abrupt rise and decline of O₃ concentrations were analyzed using Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) back trajectory, satellite NO₂ and HCHO product and the prediction by WRF-Chem model. The transport from northern cities have an important impact on pollutants observed in Hangzhou, and the chemical sensitivity of O₃ production, which were approximately evaluated using the ratio of HCHO VCDs to NO₂ VCDs in the troposphere, was turned from a mixed VOC-NO_x-limited regime into a NO_x-limited regime in Hangzhou due to the strict emission control measures.