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# Isoprene and Toluene measurements at Taehwa Research Foerst (TRF) and Seoul Metropolitan Area (SMA) during KORUS-AQ campaign

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$O_3$, Volatile Organic Compounds (VOCs), and other trace gases with aerosols were measured at Taehwa Research Forest (TRF) and at Seoul Metropolitan Area (SMA) from May 10 to June 13 during Korea-United States Air Quality (KORUS-AQ) campaign. The measurements of VOCs were conducted via Gas Chromatography – Flame Ionized Detector (GC-FID), and Proton Transfer Reaction – Time of Flight – Mass Spectrometer (PTR-ToF-MS). 50%ile, 95%ile, and 99%ile of $O_3$ concentrations were 43, 92, and 107 ppbv in TRF, and 38, 88, and 101.4 ppbv in SMA, respectively. Averaged $NO_x$ concentration was 3.6 ppbv in TRF, and 30.0 ppbv in SMA. 99%ile $O_3$ concentration in TRF was higher than that of in SMA, but 99%ile $NO_x$ concentration in TRF was extremely lower compared with that of in SMA. Although SMA is urban site and TRF is mountain forest site, averaged concentration of isoprene was higher in SMA (0.91 ppbv) than TRF (0.49 ppbv) due to the high temperature of SMA. Averaged concentration of toluene was higher in SMA (2.7 ppbv) than in TRF (1.2 ppbv).
There were several double peaks of $O_3$ observed near 3 pm and 6 pm along with the increase of $NO_x$, toluene, and isoprene. Around 1 pm, the OH reactivity of isoprene was higher than that of toluene when the $NO_x$ reached minimum concentration. However, when second peaks observed near 6pm, maximum toluene concentration in TRF was similar with average toluene in SMA, implying that the second peaks of $O_3$ in TRF were influenced by the urban plume.