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Title: Climatology of tropospheric ozone over Japan: Implications for air quality standards in a regional perspective

Abstract: Tropospheric ozone plays a central role in controlling the quality of air we breathe near the Earth's surface. Much attention has recently been paid to increasing emissions of nitrogen oxides from Asia that could have substantial impact on hemispheric ozone pollution. Continental-scale transport of ozone may affect not only enhancement of background levels but also violations of National Ambient Air Quality Standards (NAAQS). Current scientific issues to be addressed thus include clear understanding of distributions and long-term evolutions of ozone in the regional/hemispheric scales, and its interactions with local/regional air quality issues. It is, for example, important to identify pollution episodes, deconvolute contributions from transport and photochemistry, and quantify contributions from each factor. In the present study observational data obtained at ground-based stations during past five years have been collected to analyze climatology of ozone over Japan. Composite seasonal variations at several remote sites show a clear springtime maximum and a summertime minimum with a small secondary peak in autumn. At remote locations the NAAQS violations for ozone are noticeable during spring when Asian continental outflow is efficient, suggesting that long-range transport of ozone largely contributes to the violations, while photochemical production seems to dominate the violations at rural/urban locations during the summertime. We are also trying to establish a regional traceability network for ambient ozone measurements in East Asian region with a Standard Reference Photometer (SRP) from National Institute of Standards and Technology (NIST). Implementation strategy for establishing QA/QC network for ozone in the ABC-Asia and APARE-II frameworks will also be discussed.

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