Continuous observations of NO2 and aerosols by a MAX-DOAS network over Japan, Korea, China, and Russia

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In a Japan EOS Promotion Project, we have deployed MAX-DOAS (Multi-Axis Differential Optical Absorption Spectroscopy) instruments at Cape Hedo in Okinawa Island (starting in March 2007), Yokosuka (April 2007), Gwangju (February 2008), Hefei (March 2008), Zvenigorod (October 2008), and Tomsk (January 2009) to perform an automated network monitoring of vertical distribution/column of NO2 and aerosol extinction coefficient (AOD as a column) over east Asia and Russia. The objectives are to observe spatial and temporal variations of NO2 and aerosols at each site associated with different levels of pollution and to validate satellite observations and tropospheric chemical transport models. In this presentation, we will show diurnal, weekly, and seasonal variations of vertical column density of NO2 characteristic for selected sites. At Yokosuka, we observed daytime decrease with respect to the morning levels in summer and daytime increase in winter. At Cape Hedo, similar daytime decrease was observed in summer but the decrease was relatively smaller than that in Yokosuka. At Gwangju, morning peaks appeared at around 10:00 local time. Although weekday/weekend difference was negligible for Cape Hedo, it was evident for Yokosuka and Gwangju; at both sites, NO2 concentrations on Saturdays were not significantly different from weekdays, but those on Sundays were significantly low. This will be valuable for estimating weekly cycle of NOx emission rates. Winter maxima and summer minima were commonly found for the three sites, but the timings of summer minima were slightly different.