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http://dx.doi.org/10.2151/jmsj.2014-A06

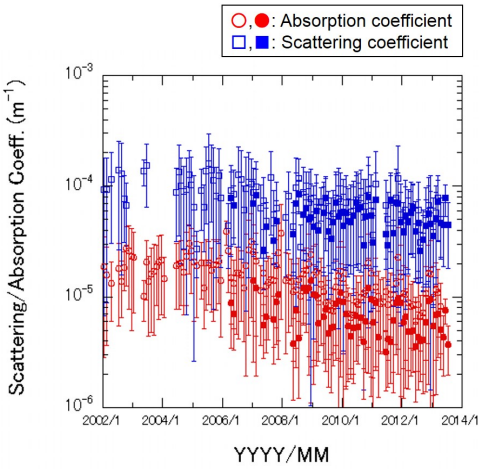

Figure 1
Monthly average absorption coefficient (○,●) at 530nm and Monthly average scattering coefficient (□,■) at 550nm in the period from 2002 to 2013. Data is monthly average and vertical bar is standard deviation. Open circle(○) is absorption coefficient measured by a wavelength PSAP and closed circle (●) is that measured by three wavelength PSAP3λ. Scattering coefficient was retrieved one. Open square (□) is retrieved using data of a wavelength PSAP and TSI 3563 nephelometer. Close square (■) is retrieved using data of three wavelength PSAP3λ and TSI 3563 nephelometer.

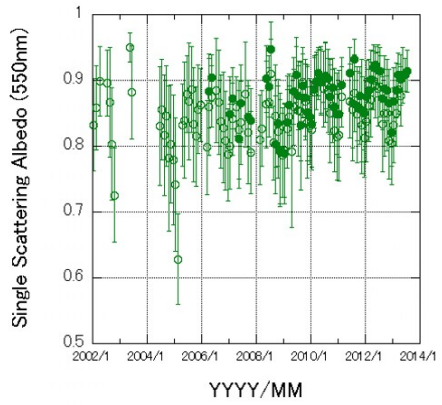

Figure 2
Same as Fig.1 except Single scattering albedo at 550nm.

- To investigate aerosol optical properties, the Meteorological Research Institute has been continuously measuring scattering and absorption coefficients since January 2002 in dry air conditions at Tsukuba, Japan.
- We used these optical data to investigate trends of aerosol properties and climatology.
- The results showed that most aerosol characteristics had seasonal variation and decreasing or increasing trends significant at the 95 % confidence level.
- From 2002 to 2013, the extinction coefficient at 550 nm and absorption coefficient at 530 nm had statistically significant decreases of -1.5×10^{-6} and -5.4×10^{-7} m^{-1} $year^{-1}$, respectively. The single scattering albedo (SSA) at 550 nm had a significant increasing trend of 7.4×10^{-3} $year^{-1}$.
- The increasing trend of 2.1×10^{-2} $year^{-1}$ in the absorption Ångström exponent from 2006 to 2013 was significant. This tendency suggests a compositional change of light-absorbing aerosol.
- The analysis using the extinction Ångström exponent showed that aerosol characteristics were dependent on the extinction Ångström exponent.
- The aerosol characteristics estimated from optical data were consistent with those derived from radiometer data.