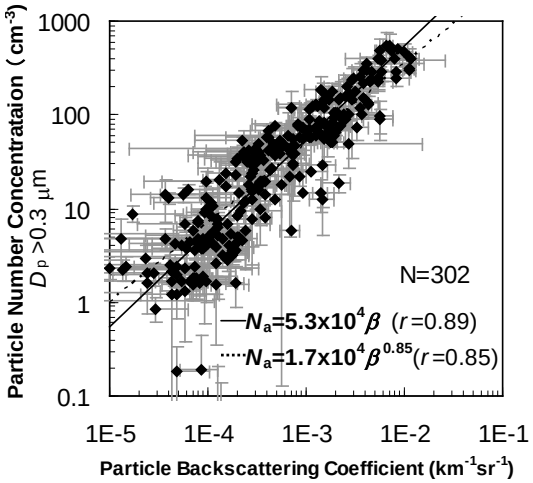
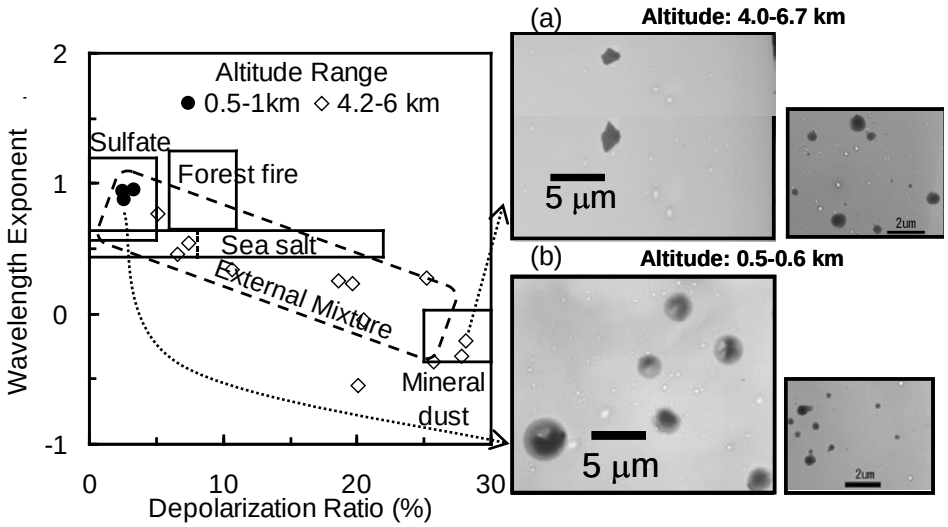
Sakai, T., T. Nagai, N. Orikasa, Y. Zaizen, K. Yamashita, Y. Mano, and M. Murakami, 2013: Aerosol characterization by dual-wavelength polarization lidar measurements over Kochi, Japan during the warm seasons of 2008 to 2010. *J. Meteor. Soc. Japan*, **91**, 789-800.
http://dx.doi.org10.2151/jmsj.2013-605



←Figure 1. Scatter plot of the particle backscattering coefficient at 532 nm versus the particle number concentration for diameter ≥ 0.3 μm over Kochi in June and Julv from 2008 to 2010.



←Figure 2.
(Left) Scatter plot of the backscatter wavelength exponent versus the particle depolarization ratio at altitudes of 0.5 to 1.0 km (solid circles) and 4.2 to 6.0 km (open diamonds) on 1 July 2008 along with typical ranges for aerosols from various sources. (Right) Transmission electron micrographs of aerosol particles collected at altitudes from (a) 4.0 to 6.7 km and (b) 0.5 to 0.6 km over Kochi on 1 July 2008.

- The particle backscattering coefficient at 532 nm correlated well with the number concentration of aerosols with diameter exceeding 0.3 μm (correlation coefficient = 0.89).
- The depolarization ratio (δ) was high (20%) and the backscatter wavelength exponent ($\mathring{a}$) was low (<0.5) between altitudes of 4 and 6 km, and they were low (δ = 2.5%) and moderate ($\mathring{a}$ = 0.7) between 0.5 and 1.0 km, suggesting the presence of supermicrometer-sized, non-spherical particles in the upper altitude range and a predominance of submicrometer-sized particles and/or spherical particles in the lower altitude range. These values were consistent with aircraft measurements, indicating the presence of supermicrometer-sized mineral particles in the upper altitude range and a predominance of submicrometer-sized sulfates and supermicrometer-sized sea-salt droplets at lower altitude.
- Our results demonstrate the utility of lidar data for aerosol characterization, although further improvement of CCN characterization by lidar is necessary.