

DERIVATION OF AEROSOL DISTRIBUTION OVER CHIBA AREA BY COMBINED ANALYSIS OF SATELLITE AND PPI LIDAR DATA

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INTRODUCTION

Aerosols are liquid or solid particles floating in the atmosphere, originated from both natural and anthropogenic sources. Aerosols exert large impact on radiation balance of the Earth's atmosphere directly, in addition to the indirect effect through cloud formation. The knowledge on aerosol distribution, however, is still insufficient for precise evaluation of their impacts. Thus, it is needed to have a monitoring technique that enables the retrieval of aerosol loading based on their optical properties.

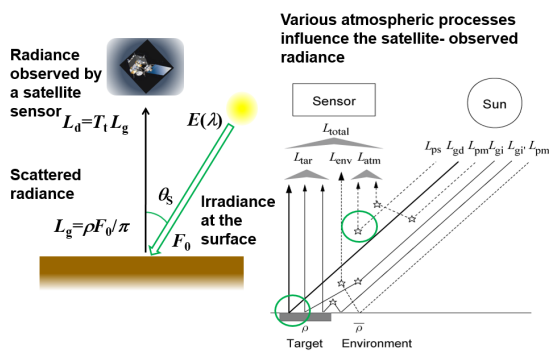
OBJECTIVE

We propose a novel combination of ground based instruments and satellite data for monitoring and retrieval of aerosol distribution as well as their optical properties.

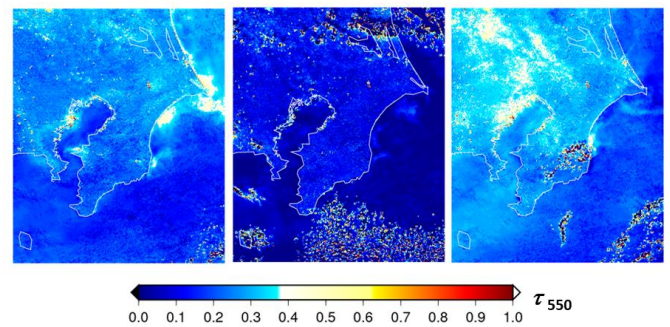
METHODS

The radiative transfer calculation is implemented for the atmospheric correction of satellite data (Landsat, Himawari-8, MODIS, etc.) taken over the Chiba area. Simultaneous measurements with the CEReS LIDAR (Atmospheric Data Collection Lidar, ADCL) will provide us with the aerosol information. Especially, the plan-position indicator (PPI) capability is useful for retrieving the horizontal distribution of aerosols, together with the information of sun-photometer and ground sampling instruments. The vertical distribution can be retrieved by means of slant-path or vertical LIDAR measurements, while the constraint values of scattering coefficient can be obtained from the nephelometer and aethalometer measurements.

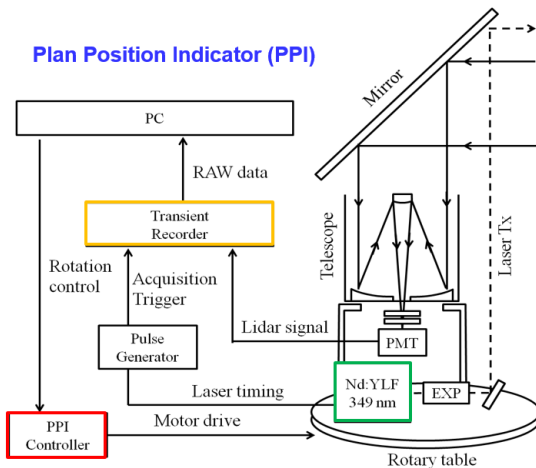
Atmospheric correction of satellite data



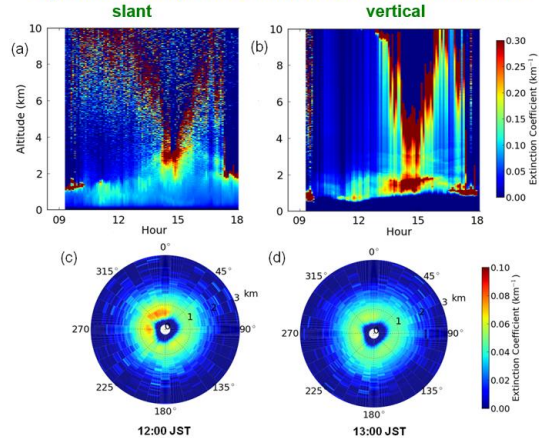
Two-dimensional distribution of AOT (550 nm)



Plan Position Indicator (PPI)



Spatial and temporal variation of aerosol distributions



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