Experimental results on measuring device of complex refractive index using the single particle extinction and scattering method

*TAKASAGO YUYA[1]

1. Tokyo university

Changes in the type and amount of atmospheric aerosol alter the albedo, resulting in radiation budget and climate change. However, the prediction accuracy of the fluctuation range is not high at the present. The complex refractive index can estimate the type of atmospheric aerosol. In the existing method, a method of measuring the complex refractive index for each bulk is mainstream, and there are few cases to measure for each single particle. If accurate measurement data of complex refractive index for each particle type can be obtained, it is possible to improve prediction accuracy of climate change width of particle type, so measurement with complex refractive index for each single particle is important. In this study, we conducted an experiment using single particle extinction and scattering method as a method to measure the complex refractive index. The single particle extinction and scattering method is a method of measuring forward scattered light intensity generated by projecting a laser on fine particles and interference between scattered light and incident light and estimating the value of the complex refractive index of the particle from these data. We developed an experimental apparatus using this method and conducted experiments with polystyrene, BC standard particles and precipitation samples (Okinawa, Happo, Fukui). Currently, I am thinking a method to solve the inverse problem that estimates particle characteristics such as particle type and complex refractive index from forward scattering intensity obtained from experiment and interference data of incident light and scattered light. For this purpose, we are developing a method of classifying samples mixed with plural types of particles into particle type by using clustering method of machine learning.

