# Satellite analysis by a multi-wavelength multi-pixel method and simultaneous method using GCOM-C/SGLI data

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Atmospheric aerosols have a significant impact on the global climate through direct and indirect climate effects. Emissions of anthropogenic aerosols are said to be increasing year by year, and more accurate estimates are needed to suppress them. In remote sensing of land and ocean, aerosols are contaminants that cause serious errors, and it is important to remove it. In this study, we performed an analysis of atmospheric aerosol by the new satellite analysis algorithm, the multi-wavelength multi-pixel method (MWP method)(Hashimoto and Nakajima, 2017), and an analysis of atmospheric aerosol and chlorophyll concentrations by the simultaneous method (Shi and Nakajima, 2017). The MWP method is a solution method in which observation values of multiple channels are used for multiple pixels at once, and the aerosol distribution is limited and derived to be smooth. The spatial distribution of the AOT obtained even in an urban area that is complicated in the horizontal direction, the smoothness, or the superiority of this method. In the simultaneous method, it is necessary to consider the effect of ocean color when analyzing aerosols, and in the contradictory situation where it is necessary to consider aerosols when analyzing ocean color, the radiative transfer process in the ocean is considered. There is a technique that allows simultaneous estimation. By using many observation data at a time, more parameters can be estimated at once than before. This problem that the computational cost for these methods was high, is being overcome by using the Neural Network method (Takenaka et al., 2011) for the radiative transfer model, which is based on a narrow band radiative transfer code, Rstar (Nakajima and Tanaka, 1986; Sekiguchi and Nakajima 2007).

In this presentation, we apply GCOM-C / SGLI observation data to these methods and show the results of atmospheric aerosols in the Kanto area, which is an urban area, and in the Amazon area, where a large-scale forest fire occurred. We also show the results of aerosols and ocean color analysis in the Ariake and Yellow Sea areas. Also, the validation results are shown with SKYNET and AERONET, and compare variables that could not be obtained with the current algorithm. For single scattering albedo, similar time dependencies are shown.

Keywords: atmospheric aerosols, satellite analysis, GCOM-C/SGLI

 