



Retrieval and Validation of Aerosol Optical Properties over East Asia from TANSO-Cloud and Aerosol Imager

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Aerosol is a significant component on air quality and climate change. In particular, spatial and temporal distribution of aerosol shows large variability over East Asia, thus has large effect in retrieving carbon dioxide from Greenhouse Gases Observing Satellite (GOSAT) Thermal And Near infrared Sensor for carbon Observation Fourier Transform Spectrometer (TANSO-FTS). An aerosol retrieval algorithm was developed from TANSO- Cloud and Aerosol Imager (CAI) onboard the GOSAT. The algorithm retrieves aerosol optical depth (AOD), size distribution of aerosol, and aerosol type in 0.1 degree grid resolution and surface reflectance was estimated using the clear sky composite method. To test aerosol absorptivity, the reflectance difference method was considered using channels of TANSO-CAI. In this study, the retrieved aerosol optical depth (AOD) was compared with those of Aerosol Robotic NETwork (AERONET) and MODerate resolution Imaging Sensor (MODIS) dataset from September 2011 and August 2014. Comparisons of AODs between AERONET and CAI show the reasonably good correlation with correlation coefficient of 0.77 and regression slope of 0.87 for the whole period. Moreover, those between MODIS and CAI for the same period show correlations with correlation coefficient of 0.7 ~ 0.9 and regression slope of 0.7 ~ 1.2, depending on season and comparison regions however, the largest error source in aerosol retrieval has been surface reflectance. Over ocean and some Land, surface reflectance tends to be overestimated, and thereby CAI-AOD tends to be underestimated. Based on the results with CAI algorithm developed, the algorithm is continuously improved for better performance.