Improvement of GOCI Yonsei Aerosol retrieval algorithm and validation during DRAGON campaign: Surface reflectance issue according to land, clear water and turbid water

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Aerosol optical properties (AOPs) over East Asia are retrieved hourly from the first Geostationary Ocean Color Imager (GOCI). GOCI Yonsei aerosol retrieval (YAER) algorithm was developed and improved continuously. Final products of GOCI YAER are aerosol optical depth (AOD), fine-mode fraction (FMF), single scattering albedo (SSA), Angstrom exponent (AE) and aerosol type in high spatial and temporal resolution.

Previous aerosol retrieval algorithm over ocean adopts surface reflectance using cox and munk technique as fixed wind speed or the minimum reflectivity technique for continuous characteristics between ocean and land. This study adopt cox and munk technique using real time ECMWF wind speed data over clear water and the minimum reflectivity technique over turbid water. For detecting turbid water, TOA reflectance of 412, 660, and 865nm was used. Over the turbid water, TOA reflectance at 660nm increases more than 412 and 865nm. It also shows more sensitivity over turbid water than dust aerosol.

We evaluated the accuracy of GOCI aerosol products using ground-based AERONET Level 2.0 products from total 38 East Asia sites and satellite-based MODIS-Aqua aerosol C6 products. The period of assessment is 3 months from March to May, 2012. Comparison results show that a correlation coefficient between the AODs at 550 nm of AERONET and GOCI is 0.884. Comparison results over ocean between GOCI and MODIS DT algorithm shows good agreement as R = 0.915.