

Aerosol data assimilation experiment using GCOM-C SGLI aerosol product

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The Global Change Observation Mission - Climate (GCOM-C) satellite was launched on 23 December 2017, for long-term environmental monitoring of the Earth. The GCOM-C satellite carries the second-generation global imager (SGLI), which is a multi-wavelength optical radiometer that has 19 observation wavelength bands from near-ultraviolet to thermal infrared and has characteristic functions such as polarization, multi-directional, and near-ultraviolet observation. SGLI observation data contributes to the improvement of the accuracy of the processes in climate models such as clouds, aerosols, sea colors, vegetation, and snow ice, and to be applied in various applications such as predictions of sand and dust storms, fishing ground, and understanding of red tide occurrence. JAXA Earth Observation Research Center (EORC) retrieves and provides quantitative information on atmospheric aerosols from SGLI data. The SGLI standard non-polarized aerosol product includes aerosol optical thickness (AOT), Angstrom exponent, and single scattered albedo on land are derived. JAXA EORC, Meteorological Research Institute of Japan Meteorological Agency (MRI/JMA), and Research Institute for Applied Mechanics (RIAM) of Kyushu University have been carrying joint research to utilize the geostationary and low-orbit satellites to monitor and predict the atmospheric aerosols, and to create an integrated aerosol product. MRI/JMA is currently developing a global aerosol prediction system that assimilates SGLI aerosol products using the global aerosol model MASINGAR. We will show the initial results of data assimilation experiments using two-dimensional variation (2D-Var) for the global aerosol model, and discuss the data verification, quality control, and the effects of the data assimilation.

Keywords: Aerosol, Satellite observation, Data assimilation