2017年12月に打ち上げられたGCOM-Cの特長
Characteristics of GCOM-C launched in Dec 2017

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JAXA polar-orbit satellite, Global Change Observation Mission for Climate (GCOM-C; SHIKISAI) which carries Second-generation Global Imager (SGLI) has been launched successfully on 23 Dec. 2017. SGLI has 19 bands from near-UV (380 nm) to thermal infrared (12 um) wavelengths with swath-width of 1150-km (for visible and near infrared bands, VNR) or 1400-km (for short-wave infrared, SWIR, and thermal infrared, TIR, bands). Key characteristics of the SGLI are (1) high spatial resolution (250 m) as a wide-swath sensor, (2) polarimetry with +/- 45 degree along-track tilting function, and (3) various on-board calibration functions.

The 250-m spatial resolution of 11 VNR bands in 380-868nm, one SWIR band of 1.6 um, and two TIR bands of 11um and 12um (especially 250-m TIR bands with 1400-km swath are very unique function) can be an advantage in monitoring fine structures of the land (e.g., land cover classification, global agriculture monitoring), coastal areas (e.g., eddy fronts and blooming area detection), sea ice, snow cover, small-scale clouds, and aerosols over urban or mountainous areas.

The SGLI polarimetry is conducted by two telescopes measuring 673-nm and 868-nm wavelength bands with +60, 0, and -60 degrees of linear polarization, which is used for calculating the Stokes vector (I, Q, and U components). The polarimetry will improve aerosol estimate over the land areas, and be possibly used for new application relating scattering such as clouds, snow, and in-water particles.

Calibration accuracy is essential to detect the global environmental change and contribute to the earth-system model improvement. SGLI has several on-board calibration functions, weekly solar and internal-lamp calibration, a high emissivity black-body, and monthly lunar calibration operation in addition to vicarious and cross calibration by using the earth observation data.

The SGLI observation and calibration functions have been confirmed in the Initial Check-Out (ICO) period, three months from the launch. The first observation images of VNR-SWIR and TIR have been acquired successfully on 1 Jan. 2018 and 22 Jan 2018 respectively. The first internal-lamp calibration and moon calibration data has been acquired on 10 Jan 2018 and 31 Jan 2018, respectively. Sensor calibration model including detector offset, gain, geometries, and their temperature dependency, which have been developed by pre-launch tests, will be confirmed and revised by the lamp, solar, moon, and earth observation data acquired in orbit.
Their results will be reflected to the calibration processing, i.e., Level-1 data. The GCOM-C Level-1 and geophysical data products derived from the Level-1 data (Level-2 and -3 data) will be evaluated by comparing in-situ observation data and other satellite products, and be released one-year after the launch.

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