

## Expectations for the GCOMC satellite mission on long-term climate observation and clouds science study

husi letu<sup>1\*</sup>, Takashi Nagao<sup>1</sup>, Takashi Nakajima<sup>1</sup>

<sup>1</sup>Research and Information Center, Tokai University

Clouds are key observation target for calculating earth energy budget and climate change study. Satellite remote sensing can observe the earth surface and the atmosphere with wide range and frequently, it is an efficient way for monitoring change of cloud properties and cloud spatial distributions. The Global Change Observation Mission (GCOMC)/Second Generation Global Imager (SGLI) is an passive optical radiometer for monitoring climate change, which is scheduled to launch in around 2014 by the Japan Aerospace eXploration Agency (JAXA).

The GCOM-C mission measures essential geophysical parameters on the Earth surface and in the atmosphere to facilitate understanding of the global radiation budget. There are 19 channels, including two polarized VNR channels in SGLI. The SGLI sensor is an optical sensor capable of multi-channel observation at wavelengths from near-UV to thermal infrared. The SGLI consists of two radiometer instruments, the Visible and Near Infrared Radiometer (VNR) and the Infrared Scanner (IRS). SGLI-VNR is capable of observing polarized, non-polarized radiance and multi-angle scanning. Sensor characteristics of polarized and multi-angle scanning are very important for determining the ice cloud shapes and aerosol studies. In the GCOMC satellite mission, cloud properties such as the cloud optical thickness, the effective particle radii, and the cloud top temperature will be retrieved from SGLI-VNR data. The International Satellite Cloud Climatology Project (ISCCP) cloud product will be produce and cloud inhomogeneity of the warm water cloud will be discussed. This is one of the new sciences of the GCOM-C satellite mission in terms of cloud sciences. Furthermore, ice crystal scattering database will be developed for ice cloud remote sensing.

Long-term cloud remote sensing data is important on improving the accuracy of the climate model and climate change study. There was a 40 year time-series cloud remote sensing data observed by the satellite instruments such as NOAA/AVHRR, Terra-Aqua/MODIS, ADEOS-II/GLI, and NPP/VIIRS until now. GCOMC/SGLI will continue the current satellite mission to observe the cloud property and contribute to the long-term climate change study.

Keywords: GCOMC/SGLI, Cloud science, Climate change, Ice cloud shapes