

# Elucidation of atmospheric particles through the integrated use of SGLI's unique features

**Sonoyo Mukai<sup>a\*</sup>, Itaru Sano<sup>b</sup>, Makiko Nakata<sup>b</sup>, Hiroshi Ishimoto<sup>c</sup>, Souichiro Hioki<sup>d</sup>, Oleg Duvovike<sup>d</sup> and Brent Holben<sup>e</sup>**

<sup>a</sup> *The Kyoto College of Graduate Studies for Informatics, Kyoto, 606-8225, Japan*

<sup>b</sup> *Kindai University, Higashiosaka, 577-8502, Japan*

<sup>c</sup> *MRI, Tsukuba, 305-0052, Japan*

<sup>d</sup> *Univ. Lille, CNRS, UMR 8518 – LOA – Laboratoire d'Optique Atmosphérique, Lille, France*

<sup>e</sup> *NASA/GSFC/AERONET, USA*

*\*Presenting author (s\_mukai@kcg.ac.jp)*

Earth observation satellite GCOM (Global Change Observation Mission-Climate)-C (SHIKISAI in Japanese) was launched in 2017 by JAXA. The SHIKISAI has already exceeded its planned life and is in late-stage operation. The SGLI (the second-generation global imager) is the only sensor on board, and performs wide-swath multispectral measurements in 19 channels from near-ultraviolet to thermal infrared, including red (674 nm designated as PL1 channel) and near-infrared (869 nm; PL2 channel) polarization channels.

This work intends to show our achievements in taking advantage of these features of SGLI.

We showcase the results from our analysis of the optically very thick BBA (Biomass Burning Aerosols) events. The results from the satellite-based analysis are compared with those from chemical transport model (CTM). The vertical profiles of black carbon (BC) concentration simulated by CTM are useful for altitude information of the BBA. Comparison of the satellite products from SGLI observations with BC distribution from the CTM simulations reveals their mutual consistency. Using 3D visualization of the California forest fires as an example, this work discusses the effects of complex terrain and optical distance from satellites.

Exploring the SGLI's unique capability and continuous 6-year global data paves the way to the advanced data exploitation from future satellite missions as a number of multi-directional polarization sensors are programmed to fly in late 2020s.