

Eight Years of GOSAT Operation in Space and New Science from GOSAT-2

*Tsuneo Matsunaga¹, Tatsuya Yokota¹, Masakatsu Nakajima², Gen Inoue³, Ryoichi Imasu⁴

1. Center for Global Environmental Research and Satellite Observation Center, National Institute for Environmental Studies, 2. Japan Aerospace Exploration Agency, 3. University of Tsukuba, 4. The University of Tokyo

Greenhouse Gases Observing Satellite (GOSAT) and its successor, GOSAT-2, are Japanese earth observing satellites for greenhouse gases (GHG) measurements from space. Both satellite projects are joint efforts among Ministry of the Environment (MOE), Japan Aerospace Exploration Agency (JAXA), and National Institute for Environmental Studies (NIES).

GOSAT was launched in January 2009 and has been operated for more than eight years. It has a Fourier transform spectrometer (FTS) for the measurements of columnar abundances of carbon dioxide (CO₂) and methane and a UV-VIS-NIR-SWIR imager (CAI) for cloud and aerosol detection. Its data are being used in various scientific researches related to climate change and atmospheric pollution monitoring such as monitoring of whole-atmosphere monthly mean carbon dioxide concentration, evaluation of inventories for anthropogenic emissions of CO₂ and methane, and PM_{2.5} mapping in asian urban regions.

GOSAT-2 will be launched in FY2018. GOSAT-2 instruments (FTS-2 and CAI-2) will be modified or improved based on the experiences of GOSAT instruments. FTS-2 will have the extended spectral coverage for carbon monoxide measurement and the intelligent pointing capability to avoid cloud contamination. CAI-2 will have multiple UV bands for more precise land aerosol monitoring and the forward/backward viewing capability to avoid sun glint over oceans. GOSAT-2's spacecraft, instruments, and ground data processing systems are currently being manufactured.

In this presentation, several scientific achievements based on GOSAT's eight-year GHG data and new science expected from GOSAT-2 will be highlighted.