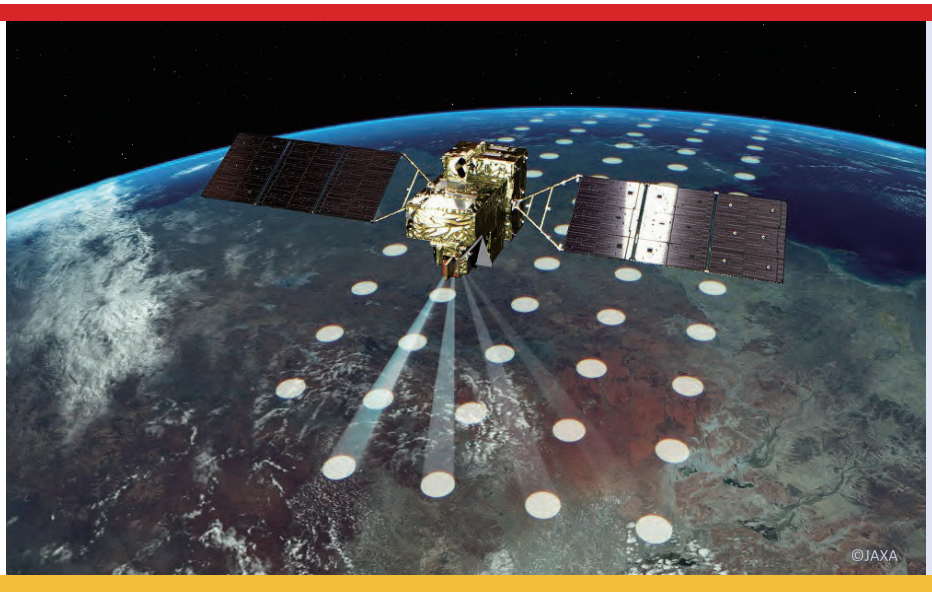
GOSAT-2 Monitors CO_2, CH_4, CO, and Aerosols from Space

Contributes to Climate Change Science and Related Policies

GOSAT-2



GOSAT-2

2018

GOSAT-2, the successor of the Greenhouse gases Observing SATellite (GOSAT, nicknamed IBUKI), has been under development jointly by the Ministry of the Environment (MOE), the National Institute for Environmental Studies (NIES), and the Japan Aerospace Exploration Agency (JAXA). The satellite will carry Fourier Transform Spectrometer 2 (FTS-2), which measures the concentrations of carbon dioxide (CO_2), methane (CH_4), and carbon monoxide (CO) with higher accuracy than its predecessor. In addition, Cloud and Aerosol Imager 2 (CAI-2) will observe aerosols including PM2.5. GOSAT-2 is scheduled for launch in FY 2018.

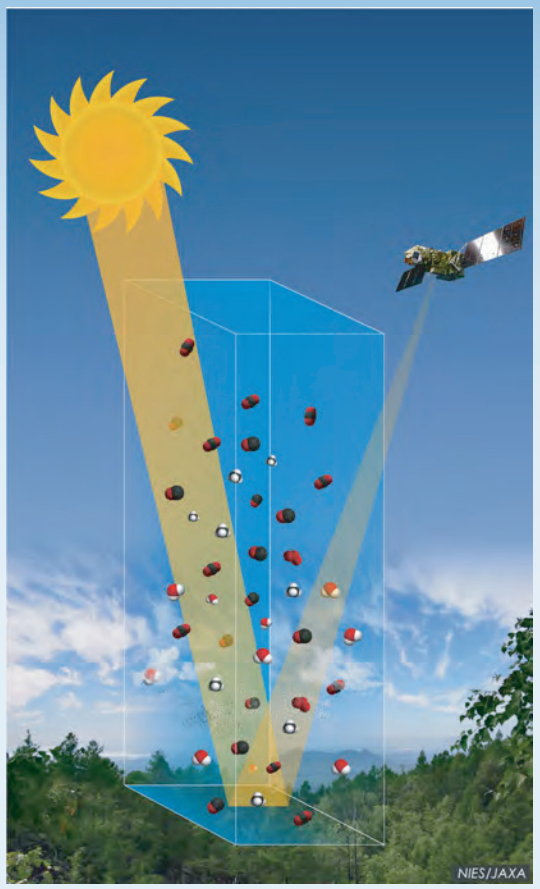
New features of GOSAT-2

- Intelligent pointing system that automatically detects cloud-free areas by using camera images of FTS-2 FOV.
- More powerful specific point observation. (target mode)
- Extended Along-track pointing angle range and the improvement of signal-noise ratio to increase data in high latitude areas and low reflectance areas.

NIES GOSAT-2 Project

The photo of GOSAT launch

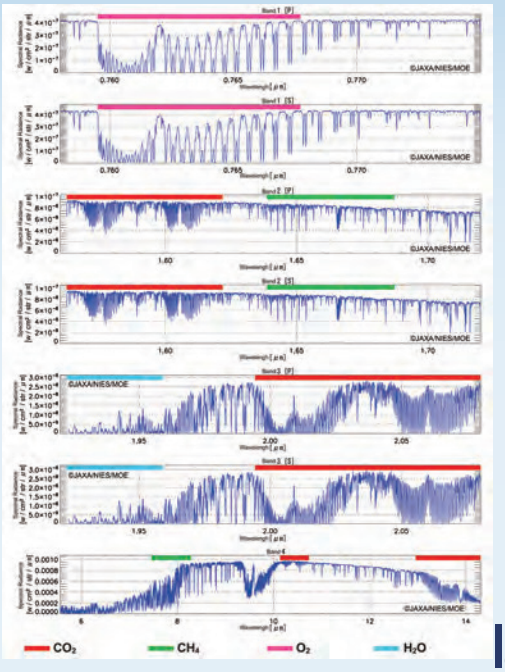
July 2018



Visualization of GOSAT-2 observation(Left).

Launch schedule: FY 2018
Size: 5.3 m×2.0 m×2.8 m
(Wing span: 16.5 m)
Designed life time: 5 years

Orbit type: Sun-synchronous, sub-recurrent
Orbit altitude: 613 km
Revisit time: 6 days



Example of radiance spectra observed by GOSAT (Upper left).

GOSAT-2 will carry two observation instruments: FTS-2 (FourierTransform Spectrometer 2) and CAI-2 (Cloud and Aerosol Imager 2). FTS-2 observes the sun light reflected by the earth's surface or scattered by clouds or aerosols and the thermal emission from both the earth's surface and the atmosphere with very high spectral resolution.
Based on data collected from these observation instruments, the National Institute for Environmental Studies estimate the concentrations and the fluxes of CO_2, CH_4, and CO, and the concentration of PM2.5.

New Goals of GOSAT-2

Observation of CO

GOSAT-2 will observe CO in addition to CO_2 and CH_4. Because the majority of CO emissions arise from fossil fuel combustion and forest fires, the concentration of CO is a clue to the source of CO_2 in the observed atmosphere.

Observation of PM2.5

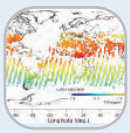
GOSAT-2 will also measure PM2.5, which makes us concerned about health damage in large cities around the world these days. A map of PM2.5 concentrations with high spatial resolution will be generated by mainly using data in the ultraviolet region by CAI-2.

Establishment of new ground-based site

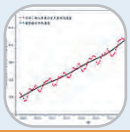
Data from GOSAT-2 will be validated using ground-based observations from TCCON*. However, current TCCON sites are mostly located in developed countries in the northern hemisphere. To eliminate the unbalance, the GOSAT-2 project established a new TCCON site in Burgos in the Philippines.
The observation instrument for the Burgos site was assembled once in Japan to conduct test observations. After dismantled and packed, the instrument was shipped from Yokohama Port at the end of November 2016 and arrived at Burgos in December via Manila Port in the Philippines. The installation of the instrument was started in January 2017. The observation at Burgos site was started in March.

*TCCON :
Total Carbon Column Observing Network

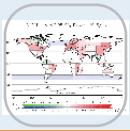
GOSAT data



CO_2 and CH_4 column amounts



Whole-atmosphere mean CO_2 and CH_4 concentrations



CO_2 and CH_4 fluxes

GOSAT data can be downloaded free of charge from the following website:

https://data2.gosat.nies.go.jp/

GOSAT-2 PROJECT
AT THE NATIONAL INSTITUTE FOR ENVIRONMENTAL STUDIES

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