

GOSAT-2

Monitors CO₂, CH₄, CO, and Aerosols from Space

Contributes to Climate Change Science and Related Policies

GOSAT-2



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GOSAT-2, the successor of the Greenhouse gases Observing SATellite (GOSAT, nicknamed IBUKI), has been in orbit since 29 October 2018. It is a joint mission of the Ministry of the Environment (MOE), the National Institute for Environmental Studies (NIES), and the Japan Aerospace Exploration Agency (JAXA).

The spacecraft carries Fourier Transform Spectrometer 2 (FTS-2), which measures the concentrations of carbon dioxide (CO₂), methane (CH₄), and carbon monoxide (CO) with higher accuracy than its predecessor. In addition, Cloud and Aerosol Imager 2 (CAI-2) observes aerosols including PM2.5.

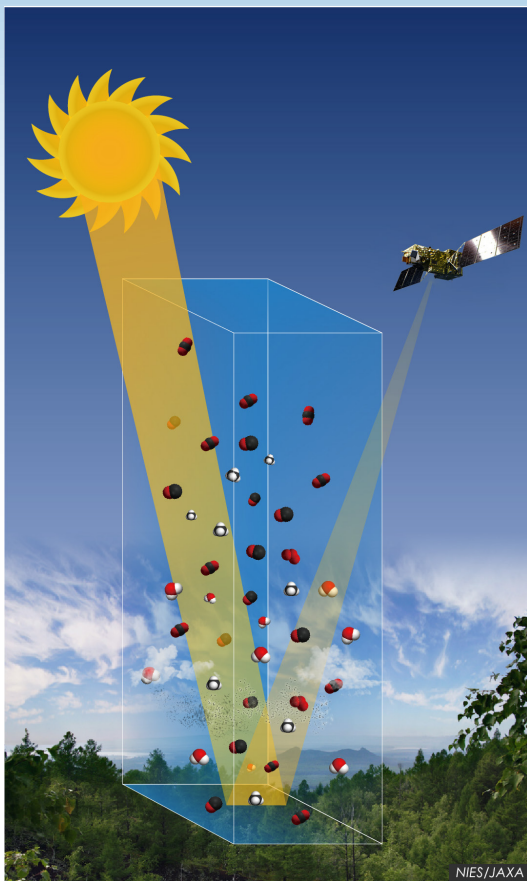
New features of GOSAT-2

- Intelligent pointing system that automatically detects cloud-free areas of the field of view of FTS-2.
- 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

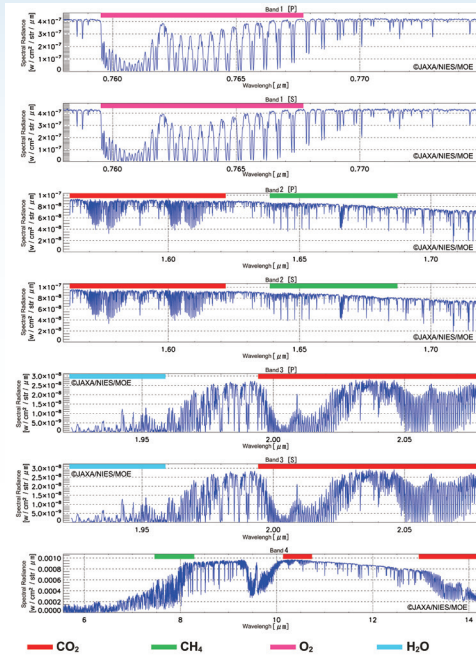


The photo of GOSAT-2 launch



Launch: 29 October 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

GOSAT-2 carries two observation instruments: FTS-2 (Fourier Transform 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 by these instruments, the National Institute for Environmental Studies estimate the concentrations and the fluxes of CO₂, CH₄, and CO, and the concentration of PM2.5.

Visualization of GOSAT-2 observation

New Goals of GOSAT-2

Observation of CO

GOSAT-2 observe CO in addition to CO₂ and CH₄. 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 CO₂ in the observed atmosphere.

Observation of PM2.5

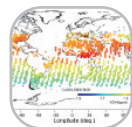
GOSAT-2 also measure PM2.5, which makes us concerned about health damage in large cities around the world these days. A map of PM2.5 concentration with high spatial resolution will be generated by mainly using data in the ultraviolet region by CAI-2.

New ground-based site

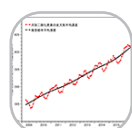
GOSAT-2 project established a new TCCON* site in Burgos in the Philippines in 2017. The observation instrument for the Burgos site was assembled once in Japan to conduct test observations and arrived at Burgos in December 2016. The observation at Burgos site was started in March 2017.



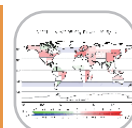
*TCCON : Total Carbon Column Observing Network



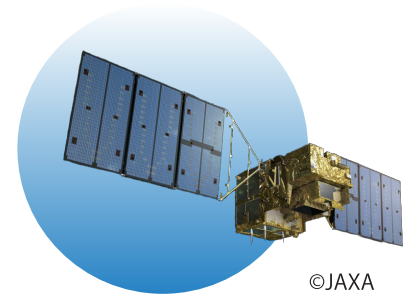
CO₂ and CH₄ column average concentrations



Whole-atmosphere mean CO₂ and CH₄ concentrations



CO₂ and CH₄ fluxes



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

GOSAT Data Archive Service



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 gosat-2-info@nies.go.jp www.gosat-2.nies.go.jp