EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Sensors and Technology (3)

Author: Mr. MASAKATSU NAKAJIMA
JAXA, Japan, nakajima.masakatsu@jaxa.jp

Dr. Hiroshi Suto
Japan Aerospace Exploration Agency (JAXA), Japan, suto.hiroshi@jaxa.jp
Mr. Yoshiyuki Ishijima
Japan Aerospace Exploration Agency (JAXA), Japan, ishijima.yoshiyuki@jaxa.jp
Mr. YASUTOSHI HYAKUSOKU
Japan Aerospace Exploration Agency (JAXA), Japan, hyakusoku.yasutoshi@jaxa.jp
Mr. kazuhiko yotsumoto
Japan Aerospace Exploration Agency (JAXA), Japan, yotsumoto.kazuhiko@jaxa.jp
Mr. masashi abe
JAXA, Japan, abe.masashi@jaxa.jp
Dr. takehiro miyakawa
JAXA, Japan, miyakawa.takehiro@jaxa.jp
Dr. Kei Shiomi
JAXA, Japan, shiomi.kei@jaxa.jp
Mr. TAKESHI HIRABAYASHI
JAXA, Japan, hirabayashi.takeshi@jaxa.jp

GREENHOUSE GASES MEASUREMENT INSTRUMENTS ON GOSAT-2

Abstract

Greenhouse gases Observing SATellite (GOSAT) is the satellite dedicated to measure the greenhouse gases, and has been operated on orbit over six years since it was launched on 23rd, January, 2009. GOSAT is loaded with two mission instruments, Fourier Transform Spectrometer (FTS) is the main instrument to observe the carobon dioxide and methane, and Cloud and Aerosol Imager (CAI) is the pushbloom imager to detect the clouds and aerosols for the compensation of the FTS data. This FTS has been observing at four spectral bands from 760nm to 14.3μm. And the CAI measures at four bands from 380nm to 1.6μm. To improve the performance of the greenhouse gases observation from space, GOSAT-2 development had been started. The principal requirements on GOSAT-2 are measuring the CO2 concentration with the accuracy of 0.5 ppm at 500km and 2,000km mesh spatial resolution over the land and ocean, respectively and 1 month average and estimating the net flux with the error of 100 percents. The mission instruments on GOSAT-2 are TANSO-FTS-2 and TANSO-CAI-2. And in conjunction with the starting of the GOSAT-2 mission, it was requires to measure the new molecule, carbon monoxide, as the correlated matter of the anthropogenic emission of the greenhouse gases to estimate the anthropogenic emission of the carbon dioxide. Therefore,the observation range of 2.0μm band was extended to 2.3μm. The observation performance of the TANSO-CAI will be improved to estimate PM2.5. including the adoption of the additional observation band, 343nm, 443nm and 550nm, and the two viewing angles, +/- 20 degrees. The three bands, 674nm, 869nm and 1.6μm, are allocated in both viewing angles. The design of GOSAT-2 were defined based on the feasibility studies and lessons and learned obtained through the development and on-orbit operation. The modulator in the FTS-2 has two corner cubes on the both edges of the swing arm with a “V” shape as with the FTS on GOSAT. But

the effective aperture of FTS-2 will be expanded to 73mm from 64mm of the FTS to increase the signal to noise ratio to improve the measurement accuracy. And to increase the number of the useful data, GOSAT-2 will equip the function to avoid the clouds during the observation using the images obtained by the monitor camera in FTS-2. In this presentation, the GOSAT-2 mission, lessons and learned of GOSAT and the design of the GOSAT-2 mission instruments will be shown as well as the satellite system.