SPACE SYSTEMS SYMPOSIUM (D1)
Lessons Learned in Space Systems (5)

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ON-ORBIT ENVIRONMENT OBSERVATION AROUND SATELLITE USING MONITOR CAMERAS ON GREENHOUSE GASES OBSERVING SATELLITE (GOSAT)

Abstract

The Greenhouse Gases Observing Satellite "IBUKI" (GOSAT) was developed to monitor the carbon dioxide (CO2) and the methane (CH4) globally from a 666 km sun-synchronous orbit. The IBUKI is the world's first dedicated satellite for Greenhouse gases measurement. The IBUKI was launched successfully by Japanese H-IIA Launch Vehicle Flight 15th (H-IIA F15) at 12:54:00 on January 23, 2009 (Japan Standard Time, JST) from the Tanegashima Space Center. The IBUKI is currently under the initial functional check phase.

The IBUKI has two sensors; Thermal And Near infrared Sensor for carbon Observation-Fourier Transform Spectrometer (TANSO-FTS) and TANSO Cloud and Aerosol Imager (TANSO-CAI). The IBUKI has also the monitor camera system (CAM). The purpose of the CAM is to monitor the contamination at the time of fairing separation and the satellite separation, the deployment status of the solar paddles, and the status of satellite surface continuously. Besides, one camera head in the TANSO-FTS is used for a check of the alignment between the TANSO-FTS and the TANSO-CAI. The CAM consists of 8 camera heads and 6 LED lights. Some electronic parts, for example CMOS module, memory, and LED are commercial off-the-shelf (COTS) parts. CAM can provide the raw image data or the JPEG compression pictures and movies.

At fairing separation, the CAM observed some outgas from the fairing. At the IBUKI separation, the particle clouds were observed around the H-IIA upper stage equipped with seven piggy-back satellites. At the solar paddles deployment, some particle flied out from the solar paddles. Those particles are under analysis. Thus, the unexpected phenomena were observed by the monitor cameras, the usefulness of the monitor camera was proved.

This paper presents the main specification of the monitor camera system on IBUKI and lessons learned from precious pictures taken on orbit.