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FIRST FLIGHT RESULT OF JAPANESE TECHNOLOGY DEMONSTRATION MISSION SDS-4

Abstract

This paper reports the first flight results of JAXA's technology demonstration mission SDS-4.

In 2006, we started the Small Demonstration Satellite (SDS) program at JAXA. This program provides useful standard platforms by series of micro satellites to newly developed components and advanced space technology with periodic launch opportunity.

The program will contribute as a strategic means of JAXA to improve reliability of space missions. This makes it possible to find out the unexpected risks, and it will open the door to adoption of the advanced space technology to JAXA's king size satellites. Launched in January 2009, its first satellite (SDS-1) continued to collect valuable mission data. Now all missions are successful and excellent results are obtained including world's first achievement.

Since the summer of 2009, we have studied the SDS bus technology development strategy and the SDS standard bus concept. Based on these accomplishments, we initiated a conceptual study of the next SDS spacecraft (i.e. SDS-4) to be launched as piggyback payload of H-IIA launch vehicle with GCOM-W1 (Global Change Observation Mission 1st - Water) and KOMPSAT-3 (Korean Multi Purpose Satellite - 3) and another small satellite in May 2012.

The main mission of the SDS-4 spacecraft is the demonstration of space based automatic identification system experiment (SPAISE), quartz crystal microbalance (QCM), flat-shaped heat pipe (FHP) which enables the transfer of exhaust heat from the narrow clearance between component and structure panel, and thermal control material (THERME) technologies developed by the JAXA-CNES joint research program.

Moreover, we seek to demonstrate the various our developed advanced bus components for micro satellites, such as OBC, PCU, TRX, small MEMS rate sensor, and QPSK communication technology.

Especially, after the launch, we start to evaluate the performance of AIS receiving system and AIS data. JAXA and JCG (Japan Coast Guard) will cooperate in evaluating AIS data for Maritime traffic safety. JAXA has a study about applications of AIS potentials with experiment partners. e.g. Efficient ship navigation, data collection ,etc. We will investigate next generation AIS receiver for JAXA's ALOS series satellites.

As described herein, we completed system proto-flight tests at the Tsukuba Space Center (TKSC) and launch site tests at the Tanegashima Space Center (TNSC), all these test results are successful.

After its a half year operation, now all missions are successful and achieving excellent flight results.