Nano-JASMINE Ready to Launch!

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Nano-JASMINE is almost complete except for the final arrangements (Figure 1). The satellite is due for launch in the current fiscal year (2011)[1]. The bus part of Nano- JASMINE satellite was developed at the Nakasuka laboratory, University of Tokyo, which has considerable experience in developing very small satellite systems. The mission part of the satellite was developed jointly by the National Astronomical Observatory and Kyoto University. The developed satellite will be launched from the Alcantara Space Launcher onboard the Cyclone-4 rocket, which has been developed by Uclaina[2].

Figure 1: The Nano-JASMINE flight model in the ATC large clean room after experiments of optical alignments.

Nano-JASMINE is the first in a series of astrometry satellites promoted by the JASMINE project office. Although the satellite's telescope has a diameter of only 5 cm, it will survey the entire sky in the zw-band (0.6–1.0 μm) during its 2-year operational life. It is expected that the satellite will measure more than 60,000 stars of magnitude less than 7 with an accuracy of less than 3 mas[3]. The European Space Agency (ESA) HIPPARCOS performed similar observations approximately 20 years ago; our mission can benefit from the large time gap between the HIPPARCOS observations and our observations, which will help us to measure accurately the proper motion of a large number of stars. Because the various techniques employed to achieve precise stellar positioning used in this mission will also be used in subsequent JASMINE missions, it is a great opportunity for the JASMINE team to verify and evaluate these techniques using real satellite data.

After the launch, we will use the Mizusawa 10 m antenna and the new 3 m antenna installed atop the 7th building of the engineering department at the University of Tokyo. We are now in the process of installing data transfer instruments at both these antenna stations, and are developing data transfer software. In the preliminary stages of satellite operation, the necessary satellite sever control will be performed from the Kiruna tracking station, located in the northern part of Sweden. The Kiruna tracking station, which is located inside the Arctic Circle, ensures a longer visibility time. Therefore, it is suitable for this mission because our satellite will be launched to a sun-synchronized orbit.

Analysis of the data acquired by Nano-JASMINE is complicated because the amount of data is enormous and all data must be solved integrated. GAIA, promoted by the ESA, has the same observation approach. It is known that GAIA's analysis tool can be used for analyzing Nano-JASMINE data[4]. The GAIA team has welcomed the use of their tool for analyzing Nano-JASMINE data, because they are interested in validating their tool with real satellite data. We have reached a memorandum of cooperation with the ESA for analyzing Nano- JASMINE data.

References

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[3] Hatsutori, Y. et al.: 2011, *EAS Publ. Series*, **45**, 397.
[4] Yamada, Y. et al.: 2011, *EAS Publ. Series*, **45**, 135.