EPSC Abstracts,
Vol. 4, EPSC2009-204-1, 2009
European Planetary Science Congress,

Kaguya mission and its lunar science

M. Kato, S. Sasaki, Y. Takizawa, and Kaguya team.

Japan Aerospace Exploration Agency (kato@planeta.sci.isas.jaxa.jp / Fax: +81-42-7598457)

Abstract

The Kaguya has been launched successfully on September 14, 2007. The steady observation term has been started on December 22, 2007 for ten months using fourteen science instruments onboard main orbiter Kaguya and two subsatellites Okina and Ohna. In the end of October, 2008 the nominal term has completed successfully with saving fuel. Low altitude operation of 50 ±20 km is being carried out since February 1, 2009. Increases of magnetic field intensity and spatial resolution are expected in this observation. Relay satellite Okina has impacted lunar farside on February 12, 2009, so gravimetry of lunar farside has finished. Main orbiter Kaguya will be hit the Moon by June 2009 before an attitude loss due to fuel exhaustion. It will be possible to impact nearside by some orbital maneuver. Observation coverage of instruments has attained to be over 95 percentage of lunar surface and it takes advantage in global science of the Moon. First papers of most instrument teams have been presented in SCIENCE, Geophysical Research Letters, Advances in Geosciences, and Earth Planets Space[1-11].

Extended mission

For three months since last October observations with 100 km altitude were extended to recover coverage incidentally lost in the nominal term. In the beginning of this February Kaguya reduced its altitude around 50 km. Stunning images of lunar surface can be taken by HDTV. Figure 1 shows a HDTV still image of Clavius crater (58.8S/14.1W, 245 km in diameter) from 50 km orbit. Magnetic field measurements also have useful merits in low altitude. Although maximum intensity of 2 nT was detected in the observation of nominal altitude, magnetic intensity over 10 nT was observed from orbits lower than 50 km enough to identify detailed magnetic anomaly of lunar surface.

Figure 1. HDTV still image of Clavius crater from 50km altitude.

References

[1] Hasebe et al., *J. Phys. Soc. Jpn.* **78** (2009) Suppl. A, pp. 18-25. /N. Yamashita et al., *J. Phys. Soc. Jpn.* **78** (2009) Suppl. A, pp. 153-156./ Karouji et al., *Adv.Geosci.* **8**(2009), in press. [2] Matsunaga et al., *Geophys. Res. Lett.* **35** (2008), L23201. [3] Haruyama et al., *Science* **322**(2008), 938-939. / Haruyama et al., *Science* **323**(2009), 905- 908. [4] Ono et al., *Science* **323**(2009), 909-911. [5] Noda et al., *Geophys. Res. Lett.* 3**5** (2008), L24203 /Araki et al., *Science* **323** (2009), 897-899. [6] Namiki et al., *Science* **323** (2009), 909-911. [7] Kikuchi et al., *Radio Sci.* **44** (2009), RS2008. [8] Saito et al., *Geophys. Res. Lett.* **35** (2008), L24205. /Yokota et al., *Geophys. Res. Lett.* **36** (2009), L38185. [9] Nagai et al., *Ann. Geophys* **27** (2009), 59- 64. [10] Kagitani et al., *Earth Planets Space* **61** (2009), in press.

[11] Pre-launch studies: *Earth Planets Space* **60** (2008), 241-444. / *Adv. Space Res.* **42** (2008), 259-346.