

L09a **Searching Satellites of Asteroid Itokawa by Imaging Observation with Hayabusa Spacecraft**

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We carried out the search of satellites around Itokawa, which was the target asteroid of the Japanese Hayabusa mission. An imaging instrument AMICA on the spacecraft was used to take four images in the vicinity of Itokawa on September 1, 2005. At this approaching phase to Itokawa, the distance of the spacecraft from Itokawa was approximately 1,700 km, and the field-of-view of AMICA corresponds to  $170 \text{ km} \times 170 \text{ km}$  around Itokawa. Since the Hill sphere of Itokawa was estimated to be 33 km at the observation time, the images completely cover the detectable area of the satellites. Unfortunately, since high energy protons produced by a huge solar flare heavily hit the spacecraft during the observation, the four images suffered from many random stains by those protons. Comparing the positions of the stains with cataloged stars, we managed to distinguish objects from the stains and stars; however, no evidence of satellites was found. We evaluate the 1-m detection limit of the images from the limiting magnitude of 9.5 mag. The absence of satellites of Itokawa are consistent with the past optical/radar observations as well as other results by the Hayabusa spacecraft.