

Albedo/Color variations on Itokawa: Difference of space weathering degree

S. Sasaki (1), J. Saito (2), M. Ishiguro (2, 3), A. Yamamoto (4), N. Hirata (5), and AMICA Team

(1) Mizusawa Astrogeocynamic Observatory, National Astronomical Observatory of Japan, Oshu, Japan, (2) ISAS/JAXA, Japan, (3) Seoul Univ., Korea, (4) RESTEC, Japan, (5) Kobe Univ. Japan (sho@miz.nao.ac.jp/Fax:+81-197-22-7120)

HAYABUSA is an engineering asteroid explorer by the Institute of Space and Astronautical Science of Japan Aerospace Exploration Agency (ISAS/JAXA) aiming at sample return from (25413) Itokawa. Between September and November 2005, HAYABUSA observed Itokawa by Asteroid Multiband Imaging CAMERA (AMICA). AMICA with 7 filters observed the whole surface of Itokawa with the solar phase angle around 10 degree with nominal resolution 70cm. The highest resolution during touch down phase is better than 1cm. Itokawa is heterogeneous in both color and albedo. The brightness difference is approximately 10-20% on distance images and as high as 30% on close-up images. Brighter areas are usually observed at locally elevated zones. Brighter areas are bluer in color and darker areas are redder. Although darker areas are covered with numerous boulders, bright areas are usually boulder-poor. Midium (10-20cm) to high (1cm) resolution images show strong evidence that bright surface was formed by removal of the superposed dark boulder rich layer. One typical example is one of the most brightest region, Shirakami. Compared with color observation and experimental data, we consider that space weathering degree of darker materials are stronger than that of brighter materials. Bright, bluer and fresh areas were exposed by removal of dark weathered surfaces by shaking caused by impacts or planetary encounters.