

[7SS-01] Disk-Resolved Optical Spectra of Near-Earth Asteroid 25143 Itokawa with Hayabusa/AMICA observations

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The Hayabusa mission successfully rendezvoused with its target asteroid 25143 Itokawa in 2005 and brought the asteroidal sample to the Earth in 2009. This mission enabled to connect the S-type asteroids to ordinary chondrites, the counterpart meteorites which exist in near Earth orbit. Recent finding of a fragment from 25143 Itokawa [1] suggested that the asteroid experienced an impact after the injection to the near-Earth orbit. In this presentation, we investigated the evidence of the recent impact on 25143 Itokawa using the onboard camera, AMICA.

AMICA took more than 1400 images of Itokawa during the rendezvous phase. It is reported that AMICA images are highly contaminated by lights scattered inside the optics in the longer wavelength. We developed a technique to subtract the scattered light by determining the point spread functions for all available channels. As the result, we first succeeded in the determination of the surface spectra in all available bands. We consider a most fresh-looking compact crater, Kamoi, is a possible impact site.

[1] Ohtsuka, K., Publications of the Astronomical Society of Japan, 63, 6, L73-L77

[7SS-02] Dynamical Evolution of the Dark Asteroids with Tisserand parameter

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It has been speculated that there could be dormant or extinct comets in the list of known asteroids, which appear asteroidal but are icy bodies originating from outer solar system. However, little is known about the existence of such objects not only because of their complicated chaotic orbits but also because of the limited physical and chemical information. AKARI infrared space mission gave us brand-new albedo catalog of Near Earth Objects, which clues in a better understanding of dark asteroids using both albedo data and dynamical models could be possible. Dark Asteroids with low (A_p) albedos are thought to be dormant or extinct comet candidates due to its similar albedo values with comet nucleus. In addition to this, dynamical models indicate that candidate cometary objects have Tisserand parameter $T < 3$. Based on both observational and dynamical criteria, we obtained 196 dark asteroids lists. We numerically integrated backward their orbits using the N-body code Mercury6 (Chambers 1999) during 10 million years to track the past orbits of bodies. We picked out 14 comet candidates that show abnormal orbits in the past by analyzing orbital elements among 196 candidates.

From the dynamical evolution simulations, we finally obtained 3 most-likely comet candidates: 944 Hidalgo, 2006 QL39, and P/Siding Spring. Two of them are consistent with past research; P/Siding Spring is a known comet and 944 Hidalgo is a most-likely comet candidate in asteroid population. Since they all have stable orbits in nowadays although they have unstable orbit in the past, we could conclude that they may be not active comets but dormant or extinct comets.