Seoul, 08826, Republic of Korea
[2]*Center for Planetary Science, Graduate School of Science, Kobe University, 7-1-48, Minatojima-Minamimachi, Chuo-Ku, Kobe 650-0047, Japan*

Recent analysis on the thermophysical property of asteroids revealed that their thermal inertia decrease with their sizes at least for main belt asteroids. However, little is known about that of comet-like bodies. In this work we utilized a simple thermophysical model (TPM) to calculate the thermal inertia of a bare nucleus of the comet P/2006 HR30 (Siding Spring) and an asteroid in comet-like orbit 107P/(4015) Wilson-Harrington from AKARI observation data. From five spectroscopic observations of the targets, we find out that the former has thermal inertia of around 2,000 J m^{-2} K^{-1} $s^{-1/2}$ (using pV = 0.055) and the latter has about 1,000-2000 J m^{-2} K^{-1} $s^{-1/2}$ (using pV = 0.055 and 0.043, respectively). These are high enough for both of them to deposit water ice at few centimeters depth, and hence it is difficult to say they are cometary based on the results of this study. These values, however, dependent significantly on the errors of observation and the uncertainties of the input parameters, as well as other conditions which are ignored in simple TPM approach, such as shape model and surface roughness. Further detailed analyses on these cometary bodies will shed light on our understanding of the detailed surfacial characteristics of them.

[구 SS-11] P/2010 A2: Dynamical properties of dust and fragments

Yoonyoung Kim, Masateru Ishiguro
Seoul National University

We revisited a recent dust emission observed at a main-belt asteroid P/2010 A2 in terms of dynamical properties of dust particles and large fragments. This is a continued research that we made a presentation at the Korean Astronomical Society 2016 Spring Meeting, but we have strengthened the dynamical analysis of the ejecta to afford the conclusive evidence for the enigmatic phenomenon. We thus constructed a model to reproduce the morphology of the dust cloud based on the dust dynamics, and succeeded in reproducing the observed morphologies in different epochs over several years. For further analysis, we reconstructed the proper motion of large fragments with respect to the dust emission source estimated from our dust model. We found that (i) the dust cloud morphologies and (ii) observed trajectories of fragments are reasonably explained only when we assumed that both were ejected from a position where no object was detected from any observations. This result suggests that the original body was shattered by an impact, leaving only debris into space. In this presentation, we will compare our results with impact laboratory studies and provide an impact interpretation of the P/2010 A2 activity.

[구 SS-12] Opposition effect on asteroid (25143) Itokawa taken with the Asteroid Multi-band Imaging Camera(AMICA)

Mingyeong Lee and Masateru Ishiguro
Seoul National University

Hayabusa, the Japanese asteroid sample returning mission, acquired more than 1400 scientific images of its target asteroid (25143) Itokawa using the Asteroid Multi-band Imaging Camera (AMICA). It took images at a wide coverage of the phase angle a (Sun-Itokawa-Hayabusa) from a~0˚ to ~35˚, providing a unique opportunity for studying the opposition effect (a sharp surge in brightness of asteroidal surface). Here we present a study of the opposition effect on Itokawa using the AMICA multi-band data. We found that (1) the opposition strength near the opposition is independent of the incident/emission angles of the light, also (2) it weakly depends on the wavelength showing the strongest surge around 0.7 um, and (3) the reflectance increases linearly at a>1.5˚ while nonlinearly at a<1.5˚ as approaching the opposition point. In particular, we noticed that the increasing rate has a correlation with the reflectance in the nonlinear domain whereas no detectable correlation with the reflectance in the linear domain. From these results, we conjecture that the coherent backscattering opposition effect is a dominant mechanism for the nonlinear opposition surge at a<1.5˚ while shadow hiding opposition effect is responsible for the linear opposition surge at a>1.5˚.