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There have been recent studies which revealed a tendency that thermal inertia decreases with the size of asteroidal bodies, and suggestions that thermal inertias of cometary bodies should be much smaller than those asteroidal counterparts, regardless of comets' nuclear sizes, which hints a way to differentiate cometary candidates from asteroids using thermal inertia information. We thus selected two comet-like objects from AKARI satellite of JAXA, namely, 107P/ (4015) Wilson-Harrington and P/2006 HR30 (Siding Spring), and applied simple thermophysical model to test the idea. Both targets did not show any comet-like activity during the observations. From the model, we found Wilson-Harrington to have size of 3.7-4.4 km, geometric albedo 0.040-0.055 and thermal inertia of 100-250 J m-2 K-1 s-0.5, which coincide with previous works, and HR30 to have size of 24-27 km, geomoetric albedo of 0.035-0.045 with thermal inertia of 250-1000 J m-2 K-1 s-0.5. HR30 is found to have the rotation pole near the ecliptic plane (the latitude between -20 and +60 deg). Based on the results, we conjecture that comet-like objects are not clearly distinguishable from asteroidal counterpart using thermal inertia.

[구 SO-05] The Spin State of NPA Rotator (5247) Krylov

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The Non-Principal Axis (NPA) rotators can be clues to spin evolutionary processes of asteroids because their excited spin states evolve due to either internal or external forces. The NPA rotation of (5247) Krylov was confirmed by Lee et al. (2017) based on KMTNet photometric observations during the 2016 apparition. We conducted follow-up observations in 2017 apparition using the 0.6-2.1m telescopes in the northern hemisphere to determine the spin state and shape model of this asteroid. We found that it is rotating in the Short Axis Mode (SAM) based on the determined rotation period ($P_\psi = 374.6\,hr$) and precession period ($P_\phi = 67.48\,hr$). The greatest and intermediate principal inertia moments are nearly the same as $I_b/I_c = 0.94$, but the smallest principal inertia moments are nearly half that of the others, $I_a/I_c = 0.43$. This ratio of principal inertia moments suggests that dynamically equivalent shape of this asteroid is close to that of a prolate ellipsoid. In this presentation, we will provide the physical model of (5247) Krylov to discuss its possible spin evolutionary processes that acted on its spin.

[구 SO-06] The polarimetric study of (331471) 1984QY1: an asteroid in comet-like orbit

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Spatial distribution of atmosphereless bodies in the solar system provides an important clue as to their origins, namely asteroids from Mainbelt or comets from outer solar system. It is, however, difficult to distinguish asteroids and dormant comets due to their similar appearances. In this study, we conducted a unique observation to differentiate asteroids and dormant comets in terms of 'polarimetry'. We observed (331471) 1984 QY1 (hereafter QY1) at large phase angles using the Multi-Spectral Imager (MSI) on the 1.6-m Pirka Telescope from UT 2016 May 25 to June 24. QY1 is a dormant comet candidate in terms of the dynamical properties (i.e. the Tisserand parameter with respect to Jupiter, TJ = 2.68). We analyzed the polarization degree of QY1 as a function of phase angle and found its maximum polarization degree, Pmax = 8.68 ± 0.28 % and 8.72 ± 0.38 %, in RC- and V-band, respectively, around the phase angle of α = 100°. In addition, we obtained the geometric albedo, pV = 0.16 ± 0.02 by means of an empirical slope-albedo law. The polarimetric properties and the albedo value we acquired are similar to those of S-type asteroids rather than cometary nuclei. In this presentation, we introduce our observation and findings. In addition, we further discuss a dynamical transportation process from Mainbelt to the current orbit.