polarimetric property of Jupiter-family comets are broadly homogeneous unlike asteroids. We will also describe future observation plans using TRIPOL and SNU 61cm telescope.

[구 KP-06] Polarimetry of Three Asteroids in Comet-Like Orbits (ACOs)

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Near-Earth objects consist of a mixture of bodies originated from outer solar system and main asteroidal belt, which are recognized as comets and near-Earth asteroids. In principal, they have orbits distinguishable by their orbital elements. It is, however, that some comets are recognized as asteroids because they could have lost the most of volatile materials in their subsurface layers. Due to their asteroidal appearances, it has been challenging to discriminate such dormant comets from a list of known asteroids. Here we propose to utilize polarimetric technique for finding such dormant comets.

We thus conducted a polarimetric observations of three candidates of dormant comet nuclei, (331471) 1984 QY1, (3552) Don Quixote and (944) Hidalgo, by using the 1.6-m Pirka Telescope at the Nayoro observatory (operated by Hokkaido University, Japan). We selected these asteroids in comet-like orbits (ACOs) based on the orbital elements (i.e., the Tisserand parameter with respect to Jupiter TJ < 3). We found that 1984 QY1 has a polarimetric albedo (geometric albedo determined via polarimetry) pV = 0.16 +/- 0.06 while both Don Quixote and Hidalgo have Rc-band polarimetric albedos pR < 0.05. In accordance with the polarimetric result together with a dynamical analysis, we surmised that 1984 QY1 could be an S-type asteroid evolved into the current orbit via 3:1 mean motion resonance with Jupiter. On the contrary, the previous spectroscopic studies indicated that Don Quixote and Hidalgo are classified into D-type taxonomic group, which are typical of comet nuclei. In this presentation, we will introduce our polarimetric observations of ACOs and emphasize that polarimetry is powerful for discriminating the asteroidal and cometary origins.