[포SS-07] High-Resolution Map of Zodiacal Dust Bands by WIZARD

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Interplanetary dust particles are observable as zodiacal light, which is the sunlight scattered by the interplanetary dust particles. The origins of interplanetary dust particles are still in question because they are eroded by Poynting-Robertson photon drag and mutual collisions among dust particles. The small-scale structures in the zodiacal light provided a clue to specify their origins. Asteroidal debris were detected as band-like structures (dust bands), and the cometary large particles were detected as narrow trails (dust trails). However, little is confirmative about their detailed origins and mineralogical compositions because of the lack of observational data particularly in the optical wavelength.

We made a high-resolution optical zodiacal light map based on the CCD observations at Mauna Kea, Hawaii. We analyzed data taken on November 12, 2004. After the data reduction, such as flat fielding and subtraction of airglow emissions, we succeeded in the construction of the zodiacal light map with the spatial resolution of 3′ in the solar elongation between 45 degree and 180 degree. This is the highest resolution map in the visible wavelength so far. In this map, we confirmed the dust bands structures near the ecliptic plane. We will discuss about the similarities and the differences between optical and infrared dust bands.

[포SS-08] Physical properties of Maria asteroid family

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An asteroid family is a population of asteroids in the proper orbital element space (a, e, i), considered to have been produced by a disruption of a large parent body presumably through a catastrophic collision. Asteroid families offer unique opportunities to reconstruct and characterize the break-up history of airless bodies in the main-belt. The Maria family is a typical old population (~3±1 Gyr) of asteroids that have undergone significant collisional and dynamical evolution in the history of the inner Solar System; it is also believed to be one of the candidate source regions for giant S-type near-earth asteroids (NEAs). However, to date, physical characteristics of this family members such as rotational periods have been known only for 61 of the larger asteroids among 3,230 objects, which accounts for less than 2 percent of the family. In this presentation, we provide some preliminary results of our recent study: out of more than dozen of the family members, lightcurves for eight objects have been obtained for the first time. We plan to increase the number of target objects, and investigate evidences for the Yarkovsky/YORP effect on Maria family based on our observations.