## [박SS-01] Rotational and Observational Properties of NEA and Asteroid Family

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The rotation of asteroids can help reveal not only the fundamental characteristics of asteroids but also the origin and evolution of our Solar System. From the photometric observations for NEA 162173 (1999 JU3) and Maria family asteroids using 0.5 m- to 2 m- class telescopes at 10 observatories in the northern hemisphere, I obtained a total of 260 lightcurves for 97 asteroids and derived synodic rotational periods for 51 objects, including newly obtained periods of 34 asteroids. For the sake of efficiency, I developed an observation scheduler, SMART (Scheduler for Measuring Asteroid RoTation) and a photometric analysis software subsystem, ASAP (Asteroid Spin Analysis Package).

Based on the lightcurve analysis of NEA 162173 (1999 JU3) and Maria family asteroids, 1) I present the rotational and observational characteristics of 1999 JU3 and provided the Hayabusa-2 Science team with the information on pole orientations, 2) I investigated correlations among rotational periods, amplitudes of lightcurves, and sizes, and conclude that the rotational properties of old-type family asteroids have been changed considerably by the YORP effect. 3) Finally, I found the Yarkovsky footprints on the Maria asteroid family and estimated that approximately 37 to 75 Maria family asteroids larger than 1 km have entered the near-Earth space every 100 Myr. This study should reveal the collisional history and transport route of the members from the resonance region to the near Earth space, for the first time.

## [구SS-02] 1 - 5 Micron Spectra of Titan: The Spectral and Altitudinal Variation of Haze

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Using solar occultation data obtained by Cassini/Visual Infrared Mapping Spectrometer (VIMS), we were able to retrieve the 1 - 5 mm optical-depth spectra of the Titanian haze, for which only selected wavelength and altitudinal ranges were previously analyzed. We found that the gross 1 - 5 mm shapes of the retrieved haze spectra are significantly different from the spectra of tholin samples in the literature. We also derived the vertical variation of the spectral structure of the 3.3 - 3.4 μm absorption feature of the Titan haze from the VIMS data recorded between 250 and 700 km altitude. We found a marked change between 480 and 580 km in the relative amplitudes of the 3.33 and 3.38 μm features which are characteristic of aromatic (double C=Cchains or rings) or aliphatic (single C-C chains) structural groups, respectively. Dicussions on this spectral and altitudinal variation will be presented.