radiative transfer equations. These equations are able to address detailed radiative processes in the atmospheres containing various gases and haze particles. We expect these radiative transfer equations can also be widely applied to the investigation of radiative transfer processes and the analyses of the spectra of celestial objects such as the Earth, the Moon, planets, and interstellar nebulae.

Bellucci et al. Icarus, 201, 198-216, 2009.
Kim, S.J. et al., Planet. Space. Sci., 59, 699-704, 2011.
Kim, S.J. et al., Planet. Space. Sci., 65, 122-129, 2012.

[구 SS-15] Polarimetric Survey of Comet 46P/Wirtanen

Evgenij Zubko[4], Maxim Zheltobryukhov[2], Ekaterina Chornaya[3,2,4], Evgenij Zubko[1], Oleksandra V. Ivanova[5,6,7], Anton Kochergin[3,2], Gennady Kornienko[2], Igor Luk'yanyk[6], Alexey Matkin[2], Igor E. Molotov[4], Sungsoo S. Kim[1], and Gorden Videen[8,1]
[1]Humanitas College, Kyung Hee University
[2]Institute of Applied Astronomy of RAS, Russia
[3]Far Eastern Federal University, Russia
[4]Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Russia
[5]Astronomical Institute of the Slovak Academy of Sciences, Slovak Republic
[6]Astronomical Observatory, Taras Shevchenko National University of Kyiv, Ukraine
[7]Main Astronomical Observatory of National Academy of Sciences, Ukraine
[8]Space Science Institute, USA

Comet 46P/Wirtanen is a Jupiter-family comet whose orbital period is of approximately 5.44 years and perihelion lying at about 1.06 au. The comet is known for being a primary target of the Rosetta space mission prior to it being rescheduled to 67P/Churyumov-Gerasimenko. In its 2018 apparition, comet 46P approached Earth within ~0.08 au, which made possible its study with relatively small telescopes. We used this rare opportunity to conduct a comprehensive study of the 46P polarization from November 16, 2018, about a month prior to its perihelion passage December 12, until January 17, 2019. Over this two-month time period, weather conditions were favorable on 13 nights. Observations were made with the 22-cm telescope located at the Ussuriysk Astrophysical Observatory (code C15), which operates within the International Scientific Optical Network (ISON). We will report our findings at the conference.

[구 SS-16] Shape model and spin state of non-principal axis rotator (5247) Krylov

Hee-Jae Lee[1,2], Josef Ďurech[3], Myung-Jin Kim[2], Hong-Kyu Moon[2], Chun-Hwey Kim[1]
[1]Chungbuk National University, [2]Korea Astronomy and Space Science Institute, [3]Charles University

The main-belt asteroid (5247) Krylov is known as a Non-Principal Axis (NPA) rotator. However, the shape model and spin state of this asteroid were not revealed. The physical model of an asteroid including spin state and shape is regarded to be important to understand its physical properties and dynamical evolution. Thus, in order to reconstruct the physical model of Kryolv, we applied the light curve inversion method using not only the optical light curves observed with ground-based telescopes in three apparitions during 2006, 2016, and 2017, but also the infrared light curves obtained with the Wide-field Infrared Survey Explorer (WISE) in 2010. We found that it is rotating in Short Axis Mode (SAM) with the rotation and precession periods of 368.71 hr and 67.277 hr, respectively. The orientation of the angular momentum vector is (298°, -58°) in the ecliptic coordinate system. The ratio of moments of inertia of the longest axis to the shortest axis is $I_a/I_c = 0.36$; the ratio of moments of inertia of the intermediate axis to the shortest axis is $I_b/I_c = 0.96$. Finally, the excitation level of this asteroid is found to be rather low with a ratio of the rotational kinetic energy to the basic spin state energy as $E/E_0 \simeq 1.024$. We will briefly discuss the possible evolutionary process of Krylov in this presentation.

천문우주관측기술

[구 AT-01] Korean Participation in All-sky Infrared Spectro-Photomeric Survey Mission, SPHEREx

Woong-Seob Jeong[1,2], Yujin Yang[1,2], Sung-Joon Park[1], Jeonghyun Pyo[1], Youngsoo Jo[1], Il-Joong Kim[1], Jongwan Ko[1,2], Hoseong Hwang[1], Yong-Seon Song[1],
SPHEREx Korean Consorthium[1,2,3,4,5,6]
[1]Korea Astronomy and Space Science Institute, Korea, [2]University of Science and Technology, Korea, [3]Kyungpook National University, Korea, [4]Kyung Hee University, Korea, [5]Seoul National University, Korea, [6]Korea Institute for Advanced Study, Korea

Since the high throughput for diffuse objects and the wide-area survey even with a small