은 그 크기와 밀접한 관련이 있는 것으로 알려져 있으며, 이들의 회전율 분포에 대한 통계적 접근방식으로 소행성의 생성과 진화에 관한 중요한 변수들을 연구할 수 있다. 이 연구에서 검출한 소행성들의 위치좌표를 MPC(Minor Planet Center)의 소행성 자료와 비교해 본 결과, 대부분 아직 공식적으로 보고되지 않은 것으로 밝혀졌다. 또한 이들의 회전주기를 측정한 결과 수십 분에서 수 시간 정도로 다양하게 나타나고 있고, 또 6.5미터 대형망원경의 집광력을 감안할 때 매우 작은 소행성들을 포함할 것이므로, 기존의 소행성의 회전율과 크기의 상관관계를 검증하고 나아가 확장할 수 있을 것으로 기대된다.

[SS-03] Population Model of Main Belt Asteroids by Debiasing Method

Hahn Yi[1,2], Yong-Ik Byun[1], and Hong-Kyu Moon[2]

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Understanding the inner solar system's evolution requires the study of the main asteroid belt structure and the population of asteroids. This is also necessary in order to estimate the probability of asteroid collisions with Earth. We are trying to build a four dimensional asteroid population model, i.e. functions of semi-major axis, eccentricity, inclination, and absolute magnitude, on a large set of observational data from major survey programs. All asteroid survey observations, however, are subjected to very severe observational biases. These biases originate not only from the asteroid orbits in relation to Earth's location, but also from the luminosity function and the distribution of observed angular velocity on the sky plane. We carefully define the bias function for each major survey program based on the observational data and pointing history kindly provided by the Minor Planet Center. Our study is based on the data from LINEAR, Catalina, SPACEWATCH, etc between 2003 and 2008. This is by far the largest data analyzed together for this purpose. Interim results will be reported for observational bias functions and populations of main belt asteroids.

[SS-04] The Interplanetary Dust Cloud Revealed by AKARI IRC All-Sky Survey Observations

Jeonghyun Pyo[1], Seung Soo Hong[1], Suk Minn Kwon[2], Munetaka Ueno[3,4], Masateru Ishiguro[5], Fumihiko Usui[4], Takafumi Ootsubo[4], Daisuke Ishihara[4], Tadashi Mukai[6], and AKARI IRC Team

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The AKARI's all-sky survey in six wavebands provides us with a priceless set of data for studying the global and local structures of the interplanetary dust cloud complex. We are currently analyzing the 9 and 18 μm band data taken by the Infrared Camera aboard AKARI. The zodiacal emission (ZE) dominates the sky brightness in these bands. This talk details the data reduction procedure and presents the resulting maps of the ZE brightness distribution. A careful comparison of the observed ZE maps with the ones synthesized with the model of Kelsall et al. (1998) suggests needs to revise their dust density profiles of the IRAS bands. We also found that the seasonal brightness variations of the north and south ecliptic poles cannot be fully reproduced by currently available models of the interplanetary dust cloud. Fourier-filtered brightness maps are prepared to resolve small-scale structures in the ZE distribution near the ecliptic plane. These will reveal new features of the faint dust bands discovered by Infrared Astronomical Satellite.

[SS-05] Retrieval of Emissivity and Temperature of the Local Interplanetary Dusts

Suk Minn Kwon[1], Jeonghyun Pyo[2], Seung Soo Hong[2], Munetaka Ueno3[,4], Masateru Ishiguro[5], Fumihiko Usui[4], Takafumi Ootsubo[4],and AKARI IRC Team

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We analyzied AKARI IRC pointing observations(IRC02) which were carried out at around perihelion and aphelion positions along the ecliptic with both NIR/MIR-S and MIR-L. By applying Lambda-differentiation method, we retrieved mean volume emissivity of the local interplanetary dusts(IPDs) at 6 IR wavelengths. The IPD temperature and mean volumetric absorption cross-section were also determined after making color correction. This is the first direct measurement of mean volume emissivity and temperature of the local IPDs. We will also discuss heliocentric distance variations of temperature and emissivity which will give some constraints to the power-law exponents in the relation for the dust temperature and IPD density.

[SS-06] Photometric Observation of Jupiter Family Comet 17P/Holmes

Myung-Jin Kim[1,2], Young-Jun Choi[2], Yong-Ik Byun[1], Junichi Watanabe[3], Reiko Furusho[3], Masateru Ishiguro[4], Yuki Sarugaku[5], and Daisuke Kinoshita[6]

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The periodic comet 17P/Holmes underwent an astonishing outburst on October 24, 2007; its apparent total brightness increased from V~17 to V~2.5 magnitude in just two days. After the outburst, 17P/Holmes may have lost some mass in the nucleus, and changed its rotation period and the color. We made time series observations for 17P/Holmes using the 1.8m telescope with 2K CCD at Bohyunsan Observatory, on the nights of 2009 January 19-22. Our observation reveals that 17P/Holmes is still active even at the heliocentric distance of about 4.22 AU. The coma and the dust tail could be obviously seen from a 300s exposed image. We will present the surface brightness profile of the coma from our co-added image, comparing with a stellar PSF, and will estimate the dust production rate calculated from the $Af\rho$ value. Also, the rotation of the nucleus derived from the brightness variation will be discussed.

■ Session : 태양 및 우주환경 I
4월 29일(수) 11:00 - 12:45 제2발표장

[초SE-01] The 27-Day Modulation of the Low Latitude Ionosphere during a Solar Maximum

Kyoung-Wook Min

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The 27-day solar modulation of the low latitude ionosphere is investigated for the solar maximum period using in situ satellite measurement data as well as the total electron contents (TEC) estimated from the satellite signals of the Global Positioning System (GPS). While the density and temperature of the topside ionosphere observed at an altitude of 685 km manifest delayed responses to the 27-day variations in the daily F10.7 values, similar to those previously reported for an altitude of 840 km, the nighttime scale height, obtained by comparing the densities observed at altitudes of 685 km and 840 km at similar local times, was shown to vary in accordance with the changes in F10.7 with the same time delay. The oxygen ion fraction measured at an altitude of 840 km shows a similar response regardless of the local time. Moreover, the GPS TEC values, most of which come from the F peak region, also exhibit similar delayed modulations in accordance with the solar rotation. The TEC value correlates well with the thermospheric neutral density, and both are observed to be modulated with the solar rotation with time delay, especially when a long term variation is filtered out. The present result confirms that the whole thermospheric and ionospheric system is modulated with the solar rotation.

[SE-02] FUV spectral analysis of the relativistic electron aurora (REA)

Chi-Na Lee[1,2], Jae-Jin Lee[2], Kyung-Wook Min[1], Kyung-Suk Cho[2] and Khan-Hyuk Kim[2]

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The auroral emissions are usually occurred by impacts of several keV precipitating electron to the ionospheric elements. While these several keV electrons effects on aurora phenomenon is well-known in the auroral science, the precipitating "hard" electron roles have been scarcely examined because of insufficient particle data. SPP aboard STSAT-1 had observed both low energy (100eV~20keV, ESA) and high energy (170 ~ 360keV, SST) electron with FUV (far ultraviolet) spectrograph which is known as FIMS. We checked the FUV auroral emissions shows good correlation with incident electron energy flux. We also examined that the line spectral variation depends on the peak energy of precipitating electron with STSAT-1 one year data from Nov. 2003 to Oct. 2004. Among these one year data, we found the coincident events between the ESA and SST data which have relativistic electron phenomenon. We show these events and compare the line ratios of 1340~1715Å which contain OI1356, NI1493 and LBH band. And we examine the FUV line-ratio verification to indicate the relativistic electron precipitating at the auroral region.

[SE-03] Thermospheric Density Variations Caused by IMF Sector Polarity Changes

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Thermospheric density is important not only for predicting the atmospheric drag in the context of the satellite ephemeris prediction, but also in understanding the thermosphere-ionosphere coupling process as well. Thermospheric density variations are controlled by various sources such as Joule/particle heating, Lorentz force,