significant contribution to $\overline{B}$ field amplification. Conversely, β effect contributing to the magnetic diffusion maintains a negative value, which plays a key role in the amplification with Laplacian $\nabla^2(=-k^2)$ for the large scale regime. In addition, negative magnetic diffusion accounts for the attenuation of plasma kinetic energy $E_V(=\langle U^2\rangle/2)$ (U: plasma velocity) when the system is saturated. The negative magnetic diffusion is from the interaction of advective term $-U\cdot\nabla B$ from magnetic induction equation and the helical velocity field. In more detail, when 'U' is divided into the poloidal component U_{pol} and toroidal one U_{tor} in the absence of reflection symmetry, they interact with $B\cdot\nabla U$ and $-U\cdot\nabla B$ from $\nabla\times\langle U\times B\rangle$leading to α effect and (negative) β effect, respectively. We discussed this process using the theoretical method and intuitive field structure model supported by the simulation result.

[구 SS-07] Photometric study of Main-belt asteroid (298) Baptistina

Dong-Heun Kim[1,2], Myung-Jin Kim[2], Hee-Jae Lee[2], Murat Kaplan[3], Orhan Erece[3,4], Taewoo Kim[5], Joh-Na Yoon[6], Anna Marciniak[7], Hong-Kyu Moon[2], Young-Jun Choi[2,8], Yonggi Kim[1]
[1]Chungbuk National University, [2]Korea Astronomy and Space Science Institute, [3]Akdeniz Universitesi, [4]TÜBITAK National Observatory, [5]National Youth Space Center, [6]Chungbuk National University Observatory, [7]Adam Mickiewicz University, [8]University of Science and Technology

The Main-belt asteroid (298) Baptistina (hereafter 'Baptistina') is regarded as an X- (or C-) type asteroid and the largest member of the Baptistina asteroid family. Its basic physical properties play an important role in understanding the rotational evolution and orbital dynamics of the Baptistina family. In this study, we determined the physical characteristics of Baptistina from the optical observations. We conducted BVRI and R band photometric observations from 2017 to 2021 for a total of 47 nights using the 0.5 - 2.0 m-class telescopes. As a result, the color indices of Baptistina were derived as , , and ; this result is consistent with the previous classification of Baptistina as an X- (or C-) type. We also determined absolute magnitude () and slope parameter () by using a simplified version of the IAU H & G function (Bowell et al. 1989) are mag and respectively. We calculated the effective radius of Baptistina of km considering the visual geometric albedo of 0.131 from the NEOWISE data. Using the light-curve inversion method, the sidereal rotation period of 16.224235 h and the 3D shape model with a pole orientation (,) were also determined. In this presentation we will introduce our observations and results, and also discuss about the physical properties of Baptistina asteroid family members such as color indices.

[구 SS-08] Reflectance-Color Trends on the Lunar Mare Surface

Sungsoo S. Kim[1] (김성수), Chae Kyung Sim[2] (심채경)
[1]Kyung Hee University, [2]Korea Astronomy and Space Science Institute

The lunar surface progressively darkens and reddens as a result of sputtering from solar wind particles and bombardment of micrometeoroids. The extent of exposure to these space weathering agents is frequently calculated as the location in a diagram of reflectance at 750 nm vs. 950 nm/750 nm color (R-C). Sim & Kim (2018) examined the R-C trends of pixels within ~3,500 craters, and revealed that the length (*L*) and skewness (*s*) of R-C trends can be employed as a secondary age or maturity indicator. We broaden this research to general lunar surface areas (3,400 tiles of 0.25˚ × 0.25˚ size) in 218 mare basalt units, whose ages have been derived from the size-frequency distribution analysis by Hiesinger et al. (2011). We discover that *L* and *s* rise with age until ~3.2 Gyr and reduce rather rapidly afterward, while the optical maturity, OMAT, reduces monotonically with time. We show that in some situations, when not only OMAT but also *L* and *s* are incorporated in the estimation utilizing 750 & 950 nm photometry, the age estimation becomes considerably more reliable. We also observed that OMAT and the lunar cratering chronology function (cumulative number of craters larger than a certain diameter as a function of time) have a relatively linear relationship.

천문화학/천문생물학

[구 AB-01] Panspermia in a Milky Way-like Galaxy

Sungwook E. Hong (홍성욱)[1], Raphael Gobat[1,2], Owain Snaith[3], Sungryong Hong (홍성용)[2]
*[1]Korea Astronomy and Space Science Institute (한국천문연구원),
[2]Pontificia Universidad Catolica de Valparaiso,
[3]Observatoire de Paris*

We study the process of panspermia in Milky